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# Infectious Disease Problems of Ornamental Plants in Ohio: 2003

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## Introduction

Disease summaries for 2003 were derived from Ohio State University Extension's *Buckeye Yard and Garden Line (BYGL)* electronic newsletter, reports from the C. Wayne Ellett Plant and Pest Diagnostic Clinic (CWEPPDC), and other reports.

As always, environmental conditions unique to the particular growing season played a big part in the profile of diseases for 2003. Spring and summer weather throughout Ohio was abnormally wet, which contributed to banner years for such foliar diseases such as apple scab, rose black spot, and anthracnoses on oak, planetrees, maple, and ash.

So let's take a look at a few of the disease profiles and disease-control perspectives from 2003. Let's also remind ourselves of the lighter and more philosophical aspects of horticulture by reviewing this past season's *BYGL*osophys at the end of this article.

But before any of that, let's start with a brief reminder of what the philosopher Krishtalka meant when he opined:

*"The beginning of wisdom is calling things by their right names."*

## A Fungus by Any Other Name

Communication is always a challenge in any job, and the green industry is no different. The old bugaboo of mistakenly thinking you understand what someone said is rife with trap after trap, even with something as simple as a name.

What's the trap in "What's in a name?" Let us begin to count the ways with a few of the items discussed in "Pest, Disease, and Weed Update" in an *American Nurseryman* magazine article by Jim Chatfield and Larry Steward.

"Fungi have both common and Latin names: Fungal plant pathogens, as well as bacteria and other plant pathogens (except for viruses) and all other organisms on earth are assigned Latin binomials. This two-part name, being the species, is composed of the genus and the specific epithet. Thus, the fungal pathogen for apple scab (with a common name of the apple scab fungus) is *Venturia inaequalis*, the rose powdery mildew fungus is *Sphaerotheca pannosa*, the fireblight bacterium is *Erwinia amylovora*, red maple is *Acer rubrum*, human beings are

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*Homo sapiens*, and so forth. Scientists do not consider viruses to be truly living organisms so they are not given Latin binomials, and simply have names such as tobacco mosaic virus (TMV) and impatiens necrotic spot virus (INSV).

“Sometimes names change: *Diplodia* tip blight is a common disease of pines, especially Austrian and mugo pines, and several other conifers. *Sphaeropsis* tip blight is a common disease of pines, especially Austrian and mugo pines, and several other conifers.



What is the difference in the two diseases? None! Only the official name of the fungal pathogen for this disease has changed. For a variety of reasons, including the realization that the majority of spores of this fungus were not two-celled, the name of the pathogen was changed from *Diplodia pinea* to *Sphaeropsis sapinea*. The same disease, the same pathogen, but now with a new pathogen and disease name. Confusing though if you think someone is talking about a brand new disease.

“Sometimes fungal names are truly imperfect: Fungi are not the only organisms for which biologists change the two-part Latin binomial names. Fungi, though, are the only ones in which there is actually a classification called Fungi Imperfecti. This moniker came about because it has historically been very difficult to connect the sexual reproduction phase of a particular fungus with the asexual reproduction phase of that same fungus. These things happen when you’re microscopic in size. This so frustrated the great Swedish classifier Linnaeus (who gave us the Latin binomial system) that he

classified all fungi in one species back in the 1750s: *Chaos fungorum!*

“Imperfections continue, though, because with some fungi, the sexual stage was given one Latin name and the asexual stage another. Thus, the apple scab fungus has the name *Venturia inaequalis*, so named partly for the unequal size of the sexual (two mating types) spores produced in the previous season’s scabby leaves in spring. But the asexual name *Spilocaea pomi* also represents the form of the fungus that occurs throughout the season without the benefit of two mating types coming together.

This is confusing when you see it written differently or even both at once in different references. Such is life!”

## Disease-Free Plants?

The term *disease-free* is often bandied about among gardeners, but is there really such a beast? In terms of a plant existing that cannot become diseased, the answer is No! All plants (or animals, or bacteria, or fungi, or any other organism for that matter) can become diseased.

Disease is a perfectly natural interaction between hosts and pathogens. We may not like that interaction, but nature, red in tooth and claw (and bacteria, fungi, and viruses), cares not for such sentiments.

Organisms can, however, have relative proneness to specific diseases. With humans and other animals, this involves an immune system and other defenses. Plants have no immune system but possess various ways to defend themselves — from single gene genetic resistance to pathogens, to hypersensitive

responses to infections, resulting in localized death of all plant cells, thus starving the pathogen and preventing spread; from physical features such as thick cuticles that help prevent infection to something we are learning more and more about called systemic acquired- and systemic-induced resistance.

In the everyday practice of horticulture, the term most used is *resistance* to plant disease. It is important to realize that the term resistance is a relative term, a sliding scale. So 'Prairifire' crabapple has excellent resistance to apple scab disease, but not immunity. 'Prairifire' will get apple scab if disease pressure is high (wet spring conditions), especially on lower leaves which stay wet longer. Note that this resistance is listed only for apple scab.

For example, 'Dolgo' crabapple has excellent apple scab resistance but has fairly high susceptibility (is less resistant) to frogeye leaf spot disease. 'Golden Raindrops' crabapple is highly resistant to scab disease, but relatively speaking, 'Golden Raindrops' is highly susceptible to fireblight disease.

So, take note of the specifics when you hear something touted as *disease-free*, or *disease-resistant*. It's all in the details.

This theory of relativity has another component, of course. Namely, that what is true in one part of the country, or in one environmental region, is not necessarily true in another.

This truth was driven home to Erik Draper and Jim Chatfield this past year when they were in Oregon and Idaho evaluating crabapples and scouting out new plots for the International Ornamental Crabapple Society (IOCS). As they reported in *BYGL*, western Oregon, west of the mountainous

rain shadow, has cool, wet spring weather and thus lots of scab pressure but less natural fireblight pressure because of the coolness of the temperatures.

Western Idaho in the Moscow area of the University of Idaho presents a different profile. The spring conditions are both dry and cool — so neither fireblight nor scab is a big factor. That is precisely why the IOCS develops evaluation plots throughout the country.

A nurseryman who sells nationwide wants to know in which markets each crabapple taxon will thrive, both disease-wise and horticulture-wise. 'Royalty' and 'Golden Raindrops' will not do so well here, due to scab and fireblight pressures, respectively, but where there is no scab, 'Royalty' can be a good purple-leaved alternative. And 'Golden Raindrops,' while a problem in many years in Ohio due to fireblight, thrives where fireblight is not a factor. The trial plots highlight why.

## Anthracnose Diseases of Shade Trees

Anthracnose diseases of a wide range of trees (*e.g.*, sycamore, oak, ash, and maple) were common this spring, especially with the cool, wet conditions during leaf emergence of many tree species.

There were many reports of anthracnose on sycamore (and much more mildly on London plane), on ash, on oak (especially white oak), and on maple.

With all these anthracnose diseases, there is the blotchy leaf discoloration associated with the major veins of the plants, but sometimes this symptom is obscured by the more extensive blotching and wilting of leaves on oak and especially sycamore.



With early sycamore anthracnose infections, for example, sometimes the damage was so extensive that leaves simply shriveled up and twig dieback occurred, and there were hardly enough leaves to even look for the characteristic reddish-brown blotching along leaf veins.

Several later-season anthracnose diseases were also commonly noted this year, including hickory anthracnose, walnut anthracnose, and with a fine line of necrosis along main leaf veins, yellowwood anthracnose. Dogwood anthracnose on flowering dogwood caused significant damage to foliage and stems of dogwoods growing in densely shaded areas.

### ***Phytophthora ramorum* Survey**

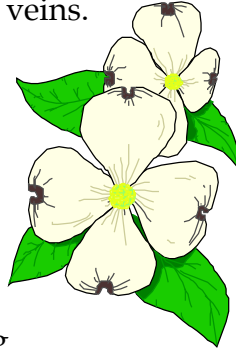
Enrico Bonello conducted a survey for *Phytophthora ramorum* in Ohio nurseries (15 counties) this summer. From more than 250 samples collected from foliar lesions and dying twigs of rhododendrons and azaleas, a *Phytophthora* sp. was isolated, but none were *Phytophthora ramorum*, the causal agent of sudden oak death and other diseases found in the Pacific Northwest in the past several years.

The usual *Phytophthora* pathogens of *Rhododendron* spp. were found, including isolates of *Phytophthora citricola*, *P. citrophthora*, *P. cactorum*, *P. nicotiana*, and others, but no *P. ramorum*.

### **Honeylocust Knot Update**

This unusual disease was profiled in the 2002 ornamental circular, at which time it was reported that the causal agent of this disease was not yet known. Enrico Bonello's lab continued to work on this perplexing problem this year, and bacteria with potential pathogenicity were

isolated. However, inoculations with these isolates did not reproduce the symptoms of honeylocust knot; therefore, to date, the pathogen for this disease is still unidentified.



### ***Botryosphaeria* Canker of Juniper**

As if *Phomopsis* dieback, *Kabatina* dieback, and cedar rusts were not enough, Nancy Taylor cultured the *Botryosphaeria* fungus from elongate cankers on a Rocky Mountain juniper (*Juniperus scopulorum*) in the CWEPPDC the season. This disease is quite a problem on this species in Kansas and other central states but has not commonly been identified in Ohio.

Appropriately enough, the sample Nancy received was the cultivar 'Wichita Blue,' which is listed in publications as being particularly susceptible to the problem, apparently even when in Ohio and not in Kansas anymore.

### **Eastern Filbert Blight**

This fungal disease, caused by *Anisogramma anomala*, can devastate a planting if left unchecked. The native hazelnut (*Corylus americana*) serves as a host for the disease organism but is somewhat tolerant to its attack. Hybrids between *C. americana* and *C. avellana* are somewhat tolerant to blight.

The fungus infects the bark, turning it dark. Twigs and branches become infected, and leaves wilt and collapse beyond the diseased portion. Eventually the fungus is characterized by rows of black pustules breaking through the bark.

Diseased portions of wood should be pruned out and burned. Fixed copper

sprays during the growing season may help control this disease. Susceptible specimens in the planting should be rogued out.

## Dodder: An Infectious Plant

Dodder (*Cuscuta* spp.) is one of the few plants that is considered a pathogen capable of causing infections of other plants (other examples include mistletoes and witchweed). Dodder is a flowering plant (tiny white flowers) but does not produce chlorophyll (though it does have chloroplasts) and gets its nutrition from plants it parasitizes by sending suckers down into the host-plant tissue.

BYGLers receive a few calls each year about dodder causing a problem on vegetable gardens or landscape beds, typically with the caller describing a light-yellow wire-like thing all tangled up in plants. One case described this year was on coreopsis and butterfly bush. Dodder is often introduced into the garden or landscape through contaminated soil, tools, or clothing. Dodder reproduces mainly by seeds.

According to the University of Minnesota Yard and Garden Brief H521D: "Dodder forms tiny flowers which may produce up to 3,000 seeds on a single plant. These seeds have a very hard seed coat which allows them to survive several years. So the results of one year's infestation can have long-term effects as these seeds germinate year after year."

Once dodder has been introduced, it is difficult to control. The best control is to remove all infested plants and dodder before the weed goes to seed. Be sure to dispose of all traces of dodder; this means

cleaning your tools and clothes. It only takes a very small portion to begin a new plant.

Repeated cultivation is also helpful as it allows more of the seed to germinate and be killed before going to seed. This decreases the number of seeds remaining in the soil.

A pre-emergent herbicide used after the desirable plants are established will have some effectiveness. It should prevent the dodder seeds from germinating without harming the plants they would latch on to.

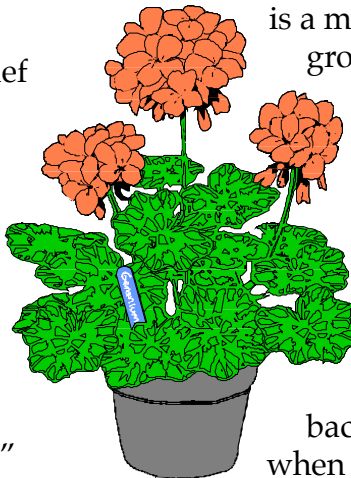
Without a host, dodder seedlings will live for only a few weeks before they die. By planting species that are not susceptible to attack by dodder, such as grasses, dodder will eventually die. Any of the ornamental grasses would be a good choice to put into infested areas for a year or two.

## Bacterial Blight of Geranium

A serious problem of florist's geranium (*Pelargonium x hortorum*) is bacterial blight caused by *Xanthomonas campestris* pv. *pelargonii*. This bacterial disease is a major problem for greenhouse growers, especially when it develops in cutting propagation. The disease is difficult to manage because cool temperatures mask disease symptoms.

Plants that seem healthy may later show symptoms when conditions favorable for the bacteria occur. This is a problem when wholesalers send plants on to growers who finish off the plants only to find, late in the production season, that plants are infected and wilt and collapse.

Symptoms include leaf spots and stem rots. Sometimes the disease does



not manifest symptoms until plants are subjected to stresses in landscape plantings.

For further information on bacterial blight of florist's geranium, please refer to *Leaf Spot and Stem Rot (Bacterial Blight) of Geranium (Pelargonium spp.)*, PP-739 (Revised), North Dakota State University Extension Service, at: <http://www.ext.nodak.edu/extpubs/plantsci/landscap/pp739w.htm>

## **Volutella Leaf Blight and Stem Canker of Pachysandra**

This disease was predictably common this year, with our sustained wet weather. Symptoms include a zonate spotting on the foliage and blackened blighting of the stems.

If you want to check to see if observed stem discoloration and wilting on pachysandra are caused by *Volutella* fungus (*Volutella pachysandricola*), put some samples in a plastic bag and wait for a few days. Orangish-pink spore masses of the fungus develop in the cankered areas.

Fungicide applications can help if you make multiple applications during periods of active growth of the pachysandra (much of the growing season, unfortunately), but mowing the planting down to an inch or two, removing all diseased and mowed plant tissue, and avoiding overhead irrigation is often the more practical solution.

Of course, the overhead irrigation in a year like 2003 is the constant rain, and alas, there is no answer for that — other than the inevitable future droughts that will come soon enough.

Now — enough of disease! Let's look at some of the plant-itudes and tree-ism philosophizing from this past year's BYGLs and from other sources, starting with some seasonal notes.

## **BYGLosophys**

*Will it not be employment enough to watch the progress of the seasons?*

— Henry David Thoreau

*The English winter — ending in July,  
To commence in August.*

— Lord Byron

*Let us love winter, because it is the spring of genius.*

— Pietro Aritino

*The trumpet of a prophecy! O Wind,  
If Winter comes, can Spring be far behind?*

— Percy Bysshe Shelley

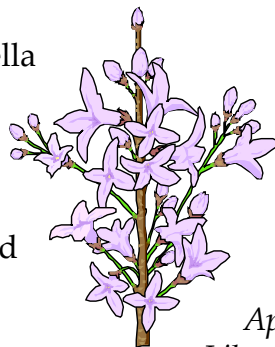
*April is the cruelest month, breeding  
Lilacs out of the dead land, mixing  
Memory and desire, stirring  
Dull roots with spring rain.*

— T. S. Eliot

*The fiddlehead ferns down by our pond  
stand like the stems of violins  
the worms are playing beneath the moss.*

*Last autumn's leaves are pierced by shoots  
that turn from sickly-pale to green.  
All growth's a slave, and rot is boss.*

— John Updike



*The melancholy days are come, the saddest of the year.*

*Of wailing winds, and naked woods,  
and meadows brown and sere.*

— William Cullen Bryant

*Sing a song of seasons!  
Something bright in all  
Flowers in the Summer,  
Fires in the Fall!*

— Robert Louis Stevenson

*No warmth, no cheerfulness, no healthful ease,  
No comfortable feel in any member —  
No shade, no shine, no butterflies, no bees,  
No fruits, no flowers, no leaves, no  
birds, —  
November!*

— Thomas Hood

*First the howling winds awoke us,  
Then the rains came down to soak us.  
Now before the mind can focus —  
Crocus.*

— Lilja Rogers

*Live in each season as it passes; breathe the  
air, drink the drink, taste the fruit, and resign  
yourself to the influences of each...Some  
men think that they are not well in spring,  
or summer, or autumn, or winter; it is only  
because they are not well in them.*

— Henry David Thoreau

*All gardening is landscape painting.*

— Alexander Pope

*Flowers leave some of their fragrance in the  
hand that bestows them.*

— Chinese proverb

*Courage is not the towering oak that sees  
storms come and go; it is the fragile blossom  
that opens in the snow.*

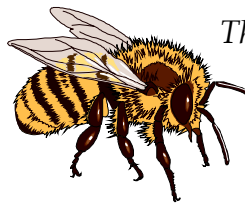
— Alice M. Swain

*The whole of nature, as has been said, is a  
conjugation of the verb to eat, in the active and  
passive.*

— William Ralph Inge

*Sunshine is delicious, rain is refreshing,  
wind braces us up, snow is exhilarating;  
there is really no such thing as bad weather,  
only different kinds of good weather.*

— John Ruskin



*The good rain, like the bad preacher, does  
not know when to leave off.*

— Ralph Waldo Emerson

*A garden is never so good as it will be  
next year!*

— Thomas Cooper

*Among gardeners, enthusiasm and experience  
rarely exist in equal measures. The beginner  
dreams of home-grown bouquets and baskets  
of ripe fruit, the veteran of many seasons has  
learned to expect slugs, mildew, and frost.*

— Roger Swain

*If you are not killing plants, you are not really  
stretching yourself as a gardener.*

— J. C. Raulston

*Gardening requires lots of water — most of it  
in the form of perspiration.*

— Lou Erickson

*Training is everything. The peach was once a bitter almond; cauliflower is nothing but cabbage with a college education.*

— Mark Twain

*In order to live off a garden, you practically have to live in it.*

— Frank McKinney Hubbard

*Rest is not idleness, and to lie sometimes on the grass on a summer day listening to the murmur of water, or watching the clouds float across the sky, is hardly a waste of time.*

— John Lubbock

*I have often thought that if heaven had given me choice of my position and calling, it should have been on a rich spot of earth, well watered, and near a good market for the productions of the garden. No occupation is so delightful to me as the culture of the earth, and no culture comparable to that of the garden.*

— Thomas Jefferson

*There's one good thing about snow, it makes your lawn look as nice as your neighbor's.*

— Clyde Moore

*Perennials are the ones that grow like weeds, biennials are the ones that die this year instead of next, and hardy annuals are the ones that never come up at all.*

— Katherine Whitehorn

*No Spring nor Summer beauty hath such grace, As I have seen in one Autumnal face.*

— John Donne

*Tickle the earth with a hoe, it will laugh a harvest.*

— Author Unknown

*There are no gardening mistakes, only experiments.*

— Janet Kilburn Phillips

*A flower is a leaf mad with love.*

— Goethe

*The Amen! of nature is always a flower.*

— Oliver Wendell Holmes Sr.