

Summary of Diseases of Landscape Plants in Ohio: 2004

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Introduction

The growing season of 2004 started wet and continued cool and wet through late spring and into mid-summer for many areas of the state, especially in the northeastern and central Ohio areas. This resulted in considerable disease pressure for many foliar diseases of landscape plants, from apple scab and rose black spot to anthracnose diseases on trees and *Botrytis* gray mold problems on herbaceous landscape plants.

In addition, continued cool and wet conditions in summer resulted in unusually severe incidences of diseases such as *Septoria* leaf spot of shrub dogwoods and downy mildew of doublefile viburnums, with considerable defoliation on these plants from these diseases in 2004. Here are additional disease highlights, gleaned from the *Buckeye Yard & Garden Line (BYGL)* and other sources. Also included is a

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discussion on fungicide use and the annual edition of *BYGLosophys* for your edification and amusement.

Breaking the Disease Cycle

Remember that of the three components of the plant disease triangle — susceptible host plant, virulent pathogen, and environment conducive to disease — the sweetest way to control disease is to prevent it in the first place by selecting plants with excellent genetic resistance to key diseases. If you find yourself each year getting call after call about why the leaves are falling off the crabapples you installed and you are muttering that “it is the same darn thing over and over again,” break the cycle.

Need an upright scab-resistant crabapple? Try ‘Adirondack.’ Need a spreading weeper? Try ‘Manbeck’s Weeper.’ A true weeper with soft pink flowers? ‘Louisa.’ Wild and crazy growth habit which somehow still works? ‘Strawberry Parfait.’ Yellow fruits? ‘Holiday Gold.’ Purple fruits? ‘Prairifire.’ Bright red fruits that persist well into winter? ‘Red Jewel.’ A Sargent type with pink flowers? ‘Candymint.’ For more on crabapple taxa and their susceptibility to apple scab disease, see the article on crabapples in this Special Circular.

Similarly, tired of those zinnias with powdery mildew disease? Try the

'Profusion' hybrids, which are crosses between *Zinnia angustifolia* and *Zinnia elegans*. Same beef with powdery mildew on beebalm? Go with *Monarda didyma* 'Petite Delight.' We do not have plants with outstanding resistance to key diseases in all of our ornamentals, but when we do, let's not waste this information. Knowledge is (flower) power!

A Wet Spring May Mean Apple Scab on Crabapple

In the world of apples and crabapples, one thing that really begins to show up during a very wet spring is the fungal disease called apple scab. The pathogen, *Venturia inaequalis*, depends upon hours of leaf wetness in order to infect susceptible leaves and fruit on apples and crabapples. Symptoms first appear in the spring as spots (lesions) on the lower leaf surface, because the lower side is first exposed to fungal spores when leaf buds open.

At first, the lesions are usually small, velvety, olive green in color, and have unclear margins. As lesions mature, the fungal infection becomes darker and more distinct. Heavily infected leaves become distorted and may begin to drop early in the summer. Trees of highly susceptible varieties may be severely defoliated by mid- to late-summer.

The apple scab fungus overwinters on infected leaves on the ground around the tree. Millions of spores are produced on these dead leaves at about the time new growth begins in the spring. During rainy periods, these spores are discharged and lodge on succulent susceptible tissue, like leaves, flower parts, and fruit.

A spore germinates in a film of water, and the fungus penetrates into the plant tissue. Depending upon weather conditions, symptoms (lesions) show up in as little as nine to 17 days. The infection originating

from the overwintering stage is called primary scab. Because a film of water on leaves and fruit is required for infection to occur, apple scab is most severe during years with frequent spring rains.

The primary scab fungus produces a different kind of spore in these newly developed lesions. Spores produced on a primary scab lesion are responsible for secondary infections. These spores are carried and spread by splashing rain to other leaves and fruits where new infections occur.

Secondary infection can occur in 12 to 20 days. This secondary infection cycle may continue to develop and spread throughout the summer. As long as environmental conditions favor development of the fungus, the cycle of infections, spore production, spore release, more infections, etc., will continue.

The use of genetically resistant or scab-immune varieties is the ideal method for controlling scab. Most commercially grown apple varieties are susceptible to scab; however, they differ in their degree of susceptibility. Crabapples vary widely in their susceptibility to the apple scab fungus, but there are many crabapples with both excellent scab resistance and superior horticultural characteristics for Ohio. Fungicides are another option but need to be applied early in the season, for crabapples starting with petal fall.

Why Disease Evaluation Is Forever

Evaluating plants for disease resistance is important — and it needs to occur in different locations, and it needs to be ongoing. For example, the International Ornamental Crabapple Society (IOCS) plots throughout the United States help provide growers with a profile of where each crabapple shines or does not shine.

'Weeping Candied Apple' belies the latter part of its name if it grows where fruit scab is severe. 'Golden Raindrops' is outstanding as long as it is not growing in a climate where it is regularly warm and wet during bloom, since these are the keys to bacterial fireblight which can be the Achilles heel for 'Golden Raindrops.'

'Thunderchild' has been defoliated by apple scab many years in Ohio. However, it is still attractive and has wonderful blueberry-colored fruits in the low scab pressure environs of Idaho.

But what of a plot at one location? Is there really any point in continuing with evaluations once you know how well a particular crabapple does? It certainly makes sense to rate new crabapples, but what about ones that have been around for a long time? Don't we know by now how well they will do? What more is there to learn?

Well, plants and their pathogens prove all the time that there are new things under the sun. A few decades ago 'Indian Magic' crabapple was listed by evaluators as "highly resistant" to apple scab. Today we would rate it as "highly susceptible." What happened? Though we have not proved it, the key is probably the development, in nature's ongoing natural laboratory, of a new race of the apple scab fungus (*Venturia inaequalis*), resulting in 'Indian Magic' now exhibiting a high degree of scab.

Is the same thing happening to 'Prairifire' at the IOCS plot at Crablandia at Secrest Arboretum in Wooster? Erik Draper and Jim Chatfield have evaluated 'Prairifire' at Secrest for over a decade, and there are records for its scab incidence (actually lack thereof) going back for more than two decades. For much of that time, it was clean as can be, but several years ago we began noticing "a trace" of scab on

'Prairifire.' This was significant because the absence of scab over the previous years was clear-cut. It was not an example of disease "escape," in which there was no disease observed simply because the plants were not challenged by the pathogen. There was plenty of *Venturia inaequalis* in the same plot, merrily defoliating other crabapples, while 'Prairifire' was unscathed. So something had changed, again presumably the presence of a new race of the scab fungus.

The latest findings? In 2004, scab on 'Prairifire' in the plot at Secrest is significantly worse, though still moderate. This might be expected, since this was a big year for scab overall due to the wet spring weather we had in much of northeast Ohio. Nevertheless scab on 'Prairifire,' at least at this location, has progressed from merely being a curiosity, probably unnoticed by most, to a level that is now obvious, though still by no means severe. Nature has demanded that we stay tuned.

Mayapple Rust

This rust disease is a spectacular annual reminder that plant pathogens interacting with plants is part of the fabric of nature, not just a landscape or garden aberration. The bright orange pustules of the mayapple rust fungus become evident on the parasol-like leaves of mayapple each May in woodlands throughout the state. The disease is seen as yellow spots on the upper leaf surfaces and incredibly bright orange pustules of the rust fungus itself on the undersurface of the leaves. In some cases these pustules result in major distortion and early senescence of the leaves.

This is an autoecious rust disease, occurring only on may-apples, not going back and forth between two

different plants such as with cedar apple rust (junipers and rosaceous hosts) or white pine blister rust (white pines and gooseberries). Populations of mayapples in the woods seem to handle the annual occurrence of this disease each year and no controls are recommended for these habitats.

Note: Two optional conventions were deliberately used in the previous item for mayapples. You could call them mayapples or you could call them may-apples. Either the compound word or the hyphenated word is acceptable, though may apples as two separate words is not. Why? Because may-apples, *Podophyllum peltatum*, a plant in the Berberidaceae or barberry family, is obviously not a “true” apple (it is not in the genus *Malus* in the Rosaceae or rose family), and to indicate this, the word is properly denoted by either hyphenating or compounding. Similar examples are pineapple and osage-orange.

***Phytophthora* Root Rot of Fraser fir**

The pathogen for this disease (*Phytophthora cinnamomi*) has a wide host range and a very bad reputation among horticulturists relative to its ability to cause root rot on plants. Fraser fir is definitely a host of this pathogen and *Phytophthora* root rot of Fraser fir was a problem for Christmas tree growers in Ohio in 2004.

One grower sent samples to Ohio State University’s C. Wayne Ellett Plant and Pest Diagnostic Clinic with significant root rot, including brownish-black root discoloration indicating the presence of the pathogen, and even some overall deep blackening of the root system. This latter is suggestive of low soil-oxygen conditions — and that is the key to how significant and successful this pathogen will be in winning the war in

the rhizosphere between pathogen and plant roots.

Although fungicides such as metalaxyl can help with management of this fungus, the presence of significant problems in field plantings suggests that the real problem to address is soil drainage. This involves either living with what you have by shifting to less susceptible crops or doing something to address drainage — not the easiest thing to accomplish if the problem is not external drainage. Sometimes growers think *Phytophthora* cannot be a problem because the plants are growing on a slope, but this ignores the reality of poor “internal” drainage, the presence of low air pore space in heavy clay soil conditions.

Black Knot of Plum

This disease, caused by the fungus *Dibotryon morbosum*, is commonly noted each year on fruiting plums and cherries and on ornamental *Prunus* species as well. The black knot fungus mainly affects twigs, branches, and fruit spurs. On infected plant parts, abnormal growth of bark and wood tissues produces small, light-brown swellings that eventually rupture as they enlarge. In late spring, the rapidly growing young knots have a soft (pulpy) texture and become covered with a velvety, olive-green growth of the fungus. In summer, the young knots turn darker and elongate. By fall, they become hard, brittle, rough, and black.

During the following growing season, the knots enlarge and gradually encircle the twig or branch. The cylindrical or spindle-shaped knots may vary from 1/2” to 1’ or more in length and up to 2” in diameter. Small knots may emerge from larger knots, forming extensive galls.

After the second year, the black knot fungus usually dies, and the gall is

invaded by secondary fungi that give old knots a white or pinkish color during the summer. Smaller twigs usually die within a year after being infected. Larger branches may live for several years before being girdled and killed by the fungus. The entire tree may gradually weaken and die if the severity of the disease increases and effective control measures are not taken.

To control this fungal disease, infected twigs should be pruned out and destroyed, or removed before bud break. It is important to prune at least 2 to 4" (5 to 10 cm) below each knot because the fungus grows beyond the edge of the knot itself. Fungicides can offer significant protection against black knot, but they are unlikely to be effective if pruning and sanitation are ignored. Where infectious spore concentrations are high because of an established black knot problem, or a neighboring abandoned orchard, protection may be needed from bud break until early summer.

For the most current fungicide recommendations and spray schedules, backyard growers are referred to Bulletin 780, *Controlling Diseases and Insects in Home Fruit Plantings*, and commercial growers are referred to Bulletin 506-A2, *Ohio Commercial Tree Fruit Spray Guide*. Both are Ohio State University Extension publications and may be obtained from your county office of OSU Extension or by contacting Media Distribution, Communications and Technology, The Ohio State University, 385 Kottman Hall, 2021 Coffey Road, Columbus, OH 43210-1044. Phone: 614-292-1607; fax: 614-292-1248. E-mail: pubs@ag.osu.edu. Visa and MasterCard accepted.

***Coccomyces* Leaf Spot of Cherry**

"Mild, wet summer weather promotes *Coccomyces* leaf spot." That should be

enough to predict it would be more noticeable than usual in the summer of 2004, and that was, indeed, the case. This leaf spot is a big deal if you are a sour cherry orchardist, and spray programs are important in such cases, but for landscape and woodland cherries, this disease is more a matter of curiosity, though we tend to get curiouser and curiouser in years like the cool, wet summer of 2004.

Symptoms start with clusters of small purple spots on one area of the leaf blade, coalescing over time, turning a dark brown, and being associated eventually with leaf yellowing and leaf drop. Sometimes areas of the spots drop out, leaving a shothole appearance, but there are also several other cherry leaf diseases that also exhibit shothole symptoms.

Final note: Modern taxonomists identify this pathogen as *Blumeriella jaapii*, but the use of the old (incorrect) name of *Coccomyces* as the pathogen name is so entrenched that "*Coccomyces* leaf spot" is retained. More than you wanted to know!

Why Fungicides 'Fail'

This fungicide does not work! I want my money back! Who recommended it! I just want a simple solution to this dratted disease!

These are common laments when it comes to fungicides and when it comes to infectious diseases. These laments reflect an understandable but unreasonable desire to make horticulture, plant pathology (the study of plant diseases), and fungicide use simple. The fact is that control of diseases and the use of fungicides is anything but simple.

It's now over a hundred years since a plant pathologist quipped that "Plant pathology must be far more than mere squirt gun botany," but this observation still holds

true. There is more to disease control than fungicides, and there is more to proper fungicide use than simply pointing and spraying. Let's look at some of the key reasons why fungicides "fail." Note that often the fault lies not in the fungicide, but in the fungicide user. As Pogo would say, "We have met the enemy — and he is us." Let's start with some examples that point out the importance of proper plant problem diagnosis.

- **Faulty Diagnosis of Disease**

This is one of the most common reasons for fungicide "failures." For example, over the years, many growers and landscape managers have complained that this or that fungicide is just not effective in controlling *Phomopsis* blight on juniper in their plantings. This disease causes the dieback of shoots of juniper and can cause quite a bit of unsightliness and damage to the plant.

As pointed out by research in Ohio and Pennsylvania, however, one of the most common reasons for "failure" is that the problem was initially misdiagnosed. Many factors cause dieback on junipers, from juniper tip midge insects and juniper tip dwarfmites to winter desiccation injury and vole damage to the stems. Naturally, if these are the causes of the dieback rather than the *Phomopsis* fungus, then fungicides will surely "fail" over and over again.

The problem is simply not a fungal disease. Proper diagnosis is Step 1 relative to proper, and successful, use of fungicides.

- **Faulty Diagnosis of the Type of Disease**

Even when a problem is correctly diagnosed as an infectious disease, fungicides may not be even part of the answer. Remember that there are different types of plant pathogens, from fungi to

bacteria, from viruses to nematodes. For example, a common term used for many diseases is "blight." *Phomopsis* blight of juniper, *Sphaeropsis* tip blight of pine, *Volutella* leaf blight of pachysandra — all are fungal diseases, and fungicides may play a role in control of these diseases.

However, fireblight of pyracantha, crabapple, and Callery pear and bacterial blight of lilac are caused by bacteria, and so different types of pesticides must be used for control, rather than simply using a fungicide, though certain copper products are helpful in control of some bacterial and fungal diseases.

Simply thinking that if it is a blight, then a fungicide should help control it, is not good enough.

- **Faulty Fungicide Selection**

Even if the problem is correctly diagnosed as a fungal disease, it is important to remember that all fungi are not equal — and all fungicides are not equal. For example, certain fungicides are effective against water mold fungi such as *Pythium* and *Phytophthora*, while other perfectly good fungicides work for other fungi, but not for water molds.

Jim Chatfield distinctly remembers two decades ago using a soil drench systemic fungicide in cutting geranium production and still getting about 25% loss to *Pythium* blackleg disease — until he realized that the benzimidazole product he was using in the Colorado greenhouse he was managing, while excellent for certain soil fungi, was next to useless for water molds. He shifted to a combination product which included a water mold fungicide (etridiazole) and got good overall control of soil fungal pathogens, and a rate of *Pythium* blackleg of about 1% to 2%.

If this were simply a quaint historical footnote, then no matter, but the same type of mistakes are being made today.

Remember that each fungicide has its strengths and weaknesses. By way of example, chlorothalonil is great for *Botrytis* and many leaf spot and leaf blight fungi; propiconazole is excellent for rusts, powdery mildew, and many leaf fungi; thiophanate-methyl is an excellent overall fungicide for leaf diseases and for certain root and crown rotting fungi but not water molds; and metalaxyl is excellent for water mold fungi but not other fungal disease problems.

- **Improper Timing**

Once the disease is properly diagnosed and the right fungicide is selected, then everything should fall into place, right? Not. Another major reason for fungicide failures is improperly timed applications.

The fact is that for fungicides to be effective, we must apply them before the disease develops. This is clearly true for “protectant” fungicides, and it is effectively true even for products which are described as “eradicants” and “curatives.”

Let’s use as an example — rose black spot disease (pathogen: *Diplocarpon rosae*). The fungal pathogen infects through leaves of susceptible rose taxa — if there are a certain number of hours of leaf wetness at a given temperature. Under these conditions, spores germinate and penetrate the leaf surface and into leaf cells where the fungus establishes a host-parasite infection.

Protectant fungicides are applied to the foliage to kill the fungus during its period of spore germination and attempted penetration of the leaf. These fungicides are essentially a toxic barrier to the fungus,

preventing the fungus from getting inside the leaf where the infection occurs. If the fungicide is not present and infection does occur, some time later (typically a week or more) symptoms of black spot disease become evident (black spots, foliar yellowing, leaf drop, plant stress).

Eradicant or curative fungicides provide a little leeway, along the order of getting rid of the fungus within 24 to 72 hours of initial infection.

There are several important things to keep in mind relative to this disease progression. First of all, you cannot see any of this happen, at least not until symptoms of black spot develop, perhaps seven to 10 days or more after initial infection. *Diplocarpon rosae* spores are invisible to the naked eye, and we also cannot see the spores germinate, penetrate, or infect the leaf cells.

Second, even the eradicant and curative products will not stop infections beyond a few days at most. So, you may spray a fungicide on what looks like a perfectly healthy, non-infected rose leaf which is nevertheless already infected and fated to develop rose black spot.

When the disease develops, of course, we rage about the fungicide not working. The fact is that it never had a chance to work if it was applied after the infection was underway. This hardly seems fair, but such is the problem with disease control. It is largely preventive in nature. You must prevent infections, not see the disease symptoms and then try to get rid of the problem.

With most diseases, all is not necessarily lost once you see the disease, since in most cases the disease is reasonably localized, and prevention of new infections is helpful in disease control even if you cannot get rid of the infections already present

by using fungicides. Applications after symptoms are observed make sense if there is a repeating cycle of the disease on the host.

For example, rose black spot keeps coming and coming all season long, so even if you see symptoms, it makes sense to prevent new infections which will surely come if the weather remains wet.

However, with cedar hawthorn rust disease, there is no repeating infection cycle on the hawthorn after initial infections in the spring, and once you see the rust spots on the leaves, there is no reason to spray. What's done is done, and there are no more infections that will come that season, so more fungicide applications are beside the point. Of course, the key in both cases is to prevent initial infections — if the particular disease in question is deemed important enough to prevent.

Remember, that each disease is unique and that understanding the disease cycle for that particular disease is the key to effective fungicide use.

- **Over Reliance on Fungicides**

Fungicides are an important tool in fungal disease control, but they are rarely stand-alone miracle answers to disease problems. Rose black spot again provides a good example. Here it is important to remember the concept of the disease triangle. This simple, but important, concept is that for disease to occur it is necessary for all three of the following to be present — a susceptible host, an environment conducive to disease, and a virulent pathogen.

In managing a rose garden for rose black spot disease, attacking the components of the disease triangle means:

- Planting as many rose taxa as possible

that have good genetic resistance to black spot disease.

- Limiting leaf wetness by avoiding overhead watering, by planting in the sun, and otherwise promoting good leaf drying conditions.
- By limiting the pathogen.

Limiting the pathogen involves good sanitation in removing diseased leaves and canes during and after the season — and the use of fungicides to prevent infections.

Of course, complete success in breaking the disease triangle at any point would control disease. For example, with the host part of the triangle, use of only roses with excellent genetic resistance to black spot would prevent the disease. Similarly, the environmental part of the disease triangle can be attacked by never allowing the leaves to get wet. This seems impossible until you realize that greenhouse rose growers can do exactly that, with greenhouse roofs stopping the rain and through the use of trickle irrigation in which the leaves stay dry. Finally, complete sanitation of black-spotted rose tissue in the garden (and nearby gardens) or complete and perfect timing and coverage with the proper fungicides could theoretically break the pathogen component of the triangle.

Reality, though, is far different. Black-spot-susceptible roses are planted or inherited by the manager due to lack of information on resistance or because certain horticultural characteristics are desired from a particular rose taxon despite black-spot susceptibility. As opposed to greenhouse production, roses grown outdoors are subject to unwanted and uncontrolled irrigation — known as rainfall — and wet years mean bad black-spot years.

Finally, sanitation and fungicide timing and coverage are never perfect. The upshot of this is that you cannot rely on any one form of disease control — and this includes fungicide use. Good plant-health-management programs require integrated approaches in which fungicides are only one component.

Avoid the mistake of waiting until you have a major problem and then trying to solve it with a quick fix.

- **Confusing Fungicide Names**

The Chinese philosopher Krishtalka noted that “The beginning of wisdom is calling things by their right names.” The same can be said about proper and successful use of fungicides and, of course, all pesticides. Pesticides have three different names — the chemical name, the common name, and the trade name.

Horticulturists usually deal with common and trade names but often fail to even realize what they have in their pesticide cabinets. For example, just a few trade names for the fungicide with the common name of chlorothalonil are Exotherm Termil, Ortho Daconil Plant Disease Control, PathGuard 6F, Thalonil, Bravo, Bravado, and Echo 500. Different formulations and different trade names, but all containing chlorothalonil. An applicator needs to know what he has at hand by knowing both trade names and common names.

Another example of knowing what is in the products you buy and use is that there are a number of combination products which combine fungicides with different activity. Some products combine a contact and a systemic fungicide. Examples would be combining thiophanate-methyl and chlorothalonil. Brand names of this combination include ConSyst WDG and Spectro WDG. Other combination

products mix in a good water mold fungicide with a fungicide good for control of other fungi. Examples would be etridiazole and thiophanate-methyl sold under the brand name of Banrot.

Horticulturist, know thy products!

- **Fungi May Develop Resistance to Fungicides**

The active ingredients of fungicides attack certain sites of the fungi that result in affecting fungal metabolic processes and killing fungal cells. Of course, as with everything in nature, fungi fight back. Through genetic recombination and mutations, over time fungi develop various modes of overcoming the action of certain fungicides.

Imagine a world in which a mutation occurs in a few individual spores out of millions and millions of spores of a particular fungal pathogen, conferring resistance of those spores to the mode of action of a particular fungicide. Imagine that you keep spraying that same fungicide over and over. The result would be that your spraying would be selecting for the survival of only the resistant strains of the fungus. Soon, only resistant strains would be present and the fungicide would lose its usefulness. The reality is that to a certain extent, this is exactly what happens.

Fungicide resistance is a real problem, and a good reason to rotate fungicides. For example, there are some great new fungicide products, called strobilurins (e.g., Heritage, Compass, Cygnus). Many fungicide users like them because they consider them “green fungicides” since they are derived from a naturally occurring organism, *Strobilurus tenacellus*. However, there are concerns over the development of resistance to the strobilurins, if used exclusively.

The simple solution is to rotate your fungicide use to different classes of fungicides, thus avoiding selecting each time for the resistant strains of the fungus. Diversify.

There are more reasons for fungicide failures, from inadequate coverage of the susceptible parts of the plants (adjuvants are sometimes necessary) to phytotoxicity from using too high a rate or using a particular product on a sensitive plant. Good horticulturists know that you need to keep observing and keep learning to effectively use any plant management tool, and fungicides are no exception.

One great learning resource for all pesticides is to READ THE LABEL. Recent polls show that fewer and fewer average Americans read pesticide labels. Lets make good on the claim that professional horticulturists are far above average!

BYGLosophys — And Then Some

Here are some thoughts to ponder in the coming year, starting with the ever-inspiring words of University of Georgia horticulture professor emeritus Michael Dirr:

*I have been fortunate to work at a great university that supports and encourages the faculty to improve their subject matter competence via sabbatical and travel. A respectable professor is an even better student. Plants are neither learned nor appreciated from Internet gleanings. They must be observed, stroked, studied, grown and photographed at different times and places. With hydrangeas on the brain, I have traveled to many collections for such activities. At one garden in the southwest of England, approximately 360 cultivars of *Hydrangea macrophylla* unfolded before my purview. The mind became mush, the knees buckled, and the camera imploded.*

And now more for your quotebook:

[on seeding]: "One for the rook, one for the crow, One to die, and one to grow."

Spring makes its own statement, so loud and clear that the gardener seems to be only one of the instruments, not the composer.

— Geoffrey B. Charlesworth

Dead Trees are like road-kill; the tree will have borers like the road-kill has maggots.

— Dan Herms

I have found, through years of practice, that people garden in order to make something grow; to interact with nature; to share, to find sanctuary, to heal, to honor the earth, to leave a mark. Through gardening, we feel whole as we make our personal work of art upon our land.

— Julie Moir Messervy

Earth knows no desolation. She smells regeneration in the moist breath of decay.

— George Meredith

In June, as many as a dozen species may burst their buds on a single day. No man can heed all of these anniversaries, no man can ignore all of them.

— Aldo Leopold

And tis my faith, that every flower enjoys the air it breathes.

— William Wordsworth

Learning is a treasure that will follow its owner everywhere.

— Chinese Proverb

Summer afternoon - summer afternoon; to me those have always been the two most beautiful words in the English language.

— Henry James

An early morning walk is a blessing for the whole day.

— Henry David Thoreau

There can be no other occupation like gardening in which, if you were to creep up behind someone at

their work, you would find them smiling.
— Mirabel Osler

Gardening is a kind of disease. It infects you, you cannot escape it. When you go visiting, your eyes rove about the garden; you interrupt the serious cocktail drinking because of an irresistible impulse to get up and pull a weed.
— Lewis Gannit

Doubt is not a pleasant condition, but certainty is an absurd one.
— Voltaire

The nature of science is such that every case is perpetually open to appeal on procedural grounds or in light of new evidence. This chronic uncertainty is what irritates many of the observers of science — and it is precisely what excites the practitioners.
— Jeffrey Lockwood, in “Locust”

What a man needs in gardening is a cast-iron back, with a hinge in it.
— Charles Dudley Warner

Nature does have manure and she does have roots as well as blossoms, and you can't hate the manure and blame the roots for not being blossoms.
— Buckminster Fuller

The supreme accomplishment is to blur the line between work and play.
— Arnold Toynbee

*By all these lovely tokens
September days are here,
With summer's best of weather
And autumn's best of cheer.*
— Helen Hunt Jackson

Observe these green meadows how they are decorated, they seem enameled with the beds of flowers.
— William Bartram, Naturalist

Winter is an etching, spring a watercolor, summer an oil painting, and autumn a mosaic of them all.
— Stanley Horowitz

The beginning of wisdom is calling things by their right name.
— Krishtalka.

Fine writers should split hairs together, and sit side by side, like friendly apes, to pick the fleas from each other's prose.
— Logan Pearsall Smith

In libraries and museums, the [scientist] may find the dry bones of knowledge, but only in Nature's own museum can he clothe those dry bones with beauty and life.
— Charles Riley.

Ecology is boring for the same reason that destruction is fun.
— Don DeLillo

Whatever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together.
— Jonathan Swift

There are two spiritual dangers in not owning a farm. One is the danger of supposing that breakfast comes from the grocery, and the other that heat comes from the furnace.
— Aldo Leopold

...making the yellow soil express its summer thought in bean leaves and blossoms rather than in wormwood and piper and millet grass, making the earth say beans instead of grass — this was my daily work.
— Henry David Thoreau

And finally...

*There was a young wormling from Rome
Who yearned to make Malus his home
He searched and he searched
For a perch to besmirch
But crab-apple was too tiny a pome.*
— 1st Earl of Pome-roy

