

OSU Extension - Auglaize County Weekly Horticulture Newsletter – 4-10-20

Broadleaf Weed Control in Lawns



It is too early to be applying herbicides to lawns to control broadleaf weeds. Most summer annual broadleaf weeds have not emerged yet. Current soil temperature is 51°F at a 0 to 4 inch depth from the following website: <http://www.greencastonline.com/tools/soil-temperature>. Weeds are not rapidly growing at the current soil and air temperatures. Wait to apply broadleaf herbicides until soil temperatures are above 60°F, air temperatures are between 65 and 75°F for multiple days, sunny conditions exist and the dandelions are near full bloom. Based upon the current forecast that means no applications should be made till early May.

To control broadleaf weeds with herbicides in turfgrass apply products containing the three active ingredients dicamba, 2,4-D, and mecoprop (MCP). Some trade names containing these active ingredients include Bayer Advanced Weed Killer for Lawns, Ortho Weed B Gon, Trimec, and Triplet. These products will control most broadleaf weeds. However, some weeds will not be completely controlled by this mixture. These weeds include groundivy (creeping Charlie), clovers, knotweed, *Oxalis*, spurge and common blue violet. To control these weeds add triclopyr with the three-way products. Turflon Ester contains the active ingredient triclopyr. To maximize common blue violet control, apply the triclopyr during full flower. Use the full labeled rates of these herbicides to maximize weed control. The University of Kentucky has a great publication (<http://www2.ca.uky.edu/agc/pubs/AGR/AGR218/AGR218.pdf>) concerning the effectiveness of several other herbicides to control some key broadleaf weeds.

Dry weed and feed products do not control broadleaf weeds as effectively as liquid sprays. If a weed and feed is your only option be sure to apply to grass during a heavy dew to activate the herbicide or irrigate very lightly for a very short time.

There are some precautions and comments about weed control and herbicide usage to consider. When using the liquid sprays be sure no rain or irrigation occurs for at least 8 hours after application, this is true for the dry products as well, except you need some moisture initially to make it work. Do not apply products containing dicamba when the air temperatures are greater than 80°F as dicamba can convert to a gas and injury desirable plant material away from the application. Apply the herbicides when the wind speed is low to reduce drift onto desirable vegetation. Do not apply these herbicides when the grass is under moisture stress, especially if adding triclopyr during dry conditions. Apply the herbicides 2 to 3 days after mowing and 2 to 3 days before mowing the lawn. Strong healthy turf will compete against weeds reducing the need for herbicides. To obtain thick healthy turf only cut 1/3 of the leaf blade, mow to a height of 3 inches, and check soil fertility levels. Do not spray the entire lawn if only a few scattered weeds are present, use a spot treatment. There are dyes available, such as Lazer Spray Pattern from Rural King, that can be used to ensure you sprayed a plant. Spring-applied broadleaf herbicides are not as effective on perennial weeds as compared to a fall application. If summer annual weeds are a problem, then spring applications are necessary, but only after the weeds emerge. Dicamba can move into the root zone of trees and shrubs and injure them.

Herbicide products containing dicamba, 2,4-D and MCPP can be purchased at Lowe's, TSC, Rural King, Walmart (at least online), local greenhouses, West Ohio True Value Hardware in Minster, and local agricultural retailers. You can even purchase herbicides from Amazon and ebay. Turflon Ester is available from Walmart, ebay and Amazon.

When using herbicides always read and follow label directions as it is the law. Also use proper personal protective equipment, especially the minimum listed on the label. Do not wear leather shoes when mixing and spraying because any pesticides spilled on the shoe will bind to the leather causing chronic exposure. Always wear chemical resistant gloves, rubber boots, and long pants (preferably a disposable coverall over pants).

Local Observations



Dwarf irises



Tulips about to flower



Peach tree flowering



Good afternoon! I pray you are well.

We received rainfall 3 days this past week. Rainfall on Saturday, April 4th ranged from a 0" near St Rt. 66 and Vogel roads, near Shelby-Fryburg and Santa Fe-New Knoxville roads, and near Valley and Idle roads to

0.05" near Fort Recovery-Minster and Sommer roads. Rainfall on Tuesday ranged from 1.1" near Fort Recovery-Minster and Sommer roads to 2.1" near Mercer Line and St. Rt. 197 roads. Rainfall on Wednesday ranged from a trace near St. Rt. 501 and Buckland-Holden roads to 0.2" near St. Rt. 29 and Harris roads, St Rt. 66 and Vogel roads, and Glynwood and Townline-Kossuth roads. Rainfall for the week ranged from 1.28" near St. Rt. 501 and Buckland-Holden roads to 2.2" near Mercer Line and St. Rt. 197 roads. The average rainfall for the week was 1.61", 0.49" more than last week.

The average high temperature now is 59 degrees F, 4 degrees higher than last week. Temperatures were above normal for 5 days and below normal for 2 days. Temperature ranged from 52 degrees F to 74 degrees F. The average high temperature for the week was 64.1 degrees F which is 5.1 degrees F warmer than the historical average high. Temperatures for the next two weeks will be mostly below average with some freezing temperatures, so peaches and maybe pears may be seriously damaged.

More flowers and trees are flowering. Peach trees are flowering. The garden is drying again very slowly. I did not get anything planted earlier in the week and based upon the current forecast that is probably good.

VegNet

Freeze / Frost Potential in Ohio – Aaron Wilson, Jim Jasinski

April 6²⁰²⁰

Share2

Now that the calendar has turned to April and warmer temperatures are becoming more frequent, those with horticultural interests are eager for the start of the growing season. But April can be a fickle month, with both warm spring rains and lingering cold nights that bring hard freezes and frost and occasionally, even a late-season snowfall. The threat of spring cold temperatures on horticultural production and operations (seeding, transplanting and flowering/fruit) can be greater following early season warmth, where phenological conditions may be advanced for this time of year.

Winter (December 2019 – February 2020) averaged 2-8°F above average compared to the climatological normal (1981-2010; Fig. 1). This warmth continued throughout March as well, with temperatures 4-8°F (west to east) above average. As a result, growing degree day accumulations range from the mid-60s (Ashtabula

County) to nearly 200 (Lawrence County) after the first week of April 2020, with our landscapes, fruit trees, and gardening equipment coming to life.

Average Temperature (°F): Departure from 1981-2010 Normals
 December 01, 2019 to February 29, 2020

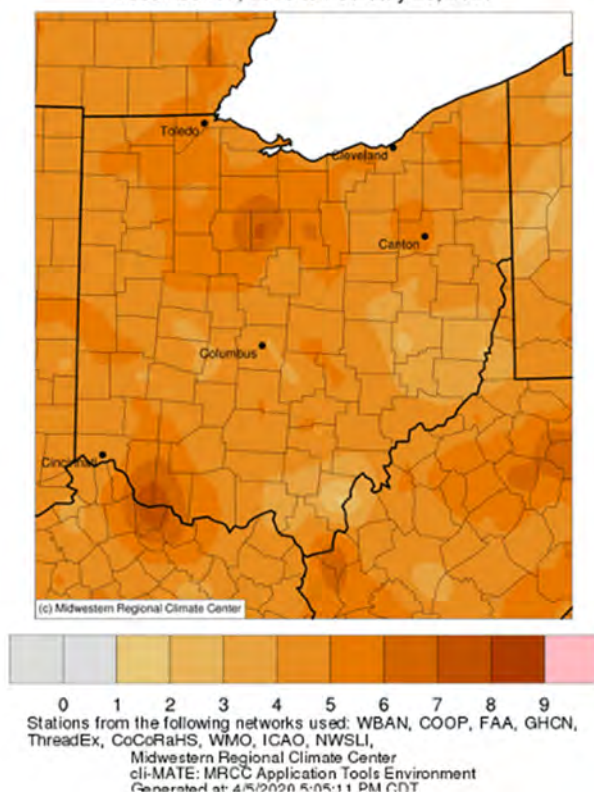


Figure 1: Departure from average (1981-2010) temperatures for December 2019 – February 2020. Figure generated by the Midwest Regional Climate Center (<http://mrcc.illinois.edu>).

Frost and Freeze Potential

What is Ohio's typical expectations regarding freeze ($\leq 32^{\circ}\text{F}$) conditions in April and May? On average, locations throughout Ohio experience their last seasonal freeze from mid-April (southern Ohio) through mid-May (northeastern Ohio). Timing varies year to year and across Ohio. For a regional analysis, we have selected 8 locations from around Ohio to compare typical last seasonal freeze conditions (Fig. 2).

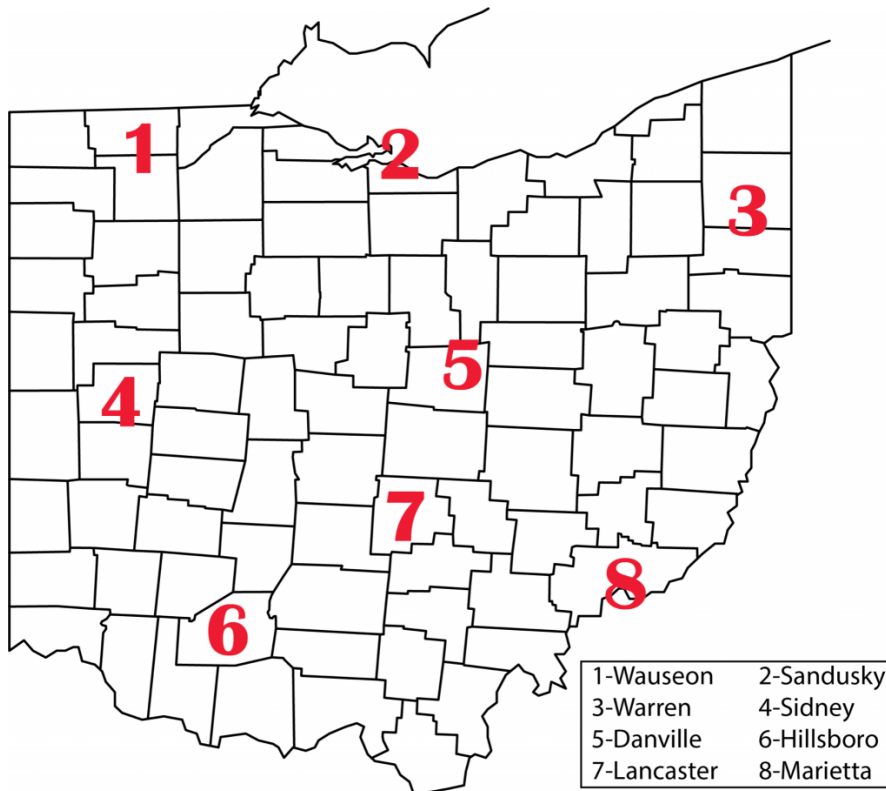


Figure 2: Selected locations around Ohio for freeze potential analysis displayed in Fig. 3.

Figure 3 shows the probability of experiencing a later freeze in Spring than indicating by the line graphs. All locations show probability based on the most recent 30-year period (1990-2019) except for 7-Lancaster (1996-2019). For each location, five temperatures are displayed (20°F-purple, 24°F-blue, 28°F-green, 32°F-yellow, and 36°F-red). For the purposes of this article we will focus on 32°F and 28°F (considered a hard/killing freeze). The bottom (x-axis) shows the probability that each of these temperatures will occur **after** a given date (indicated by the left or y-axis).

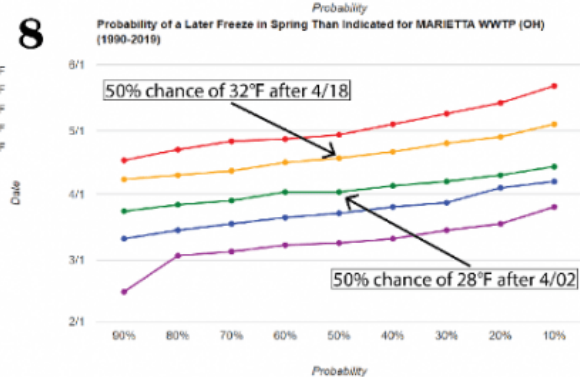
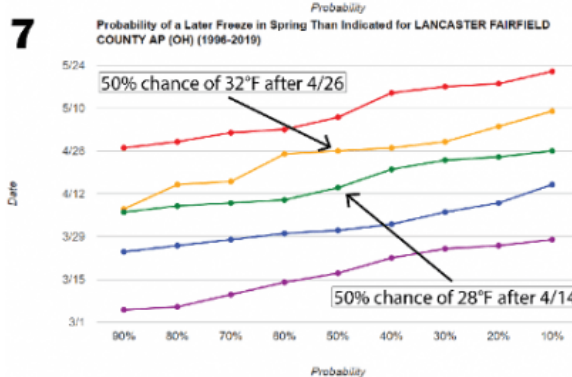
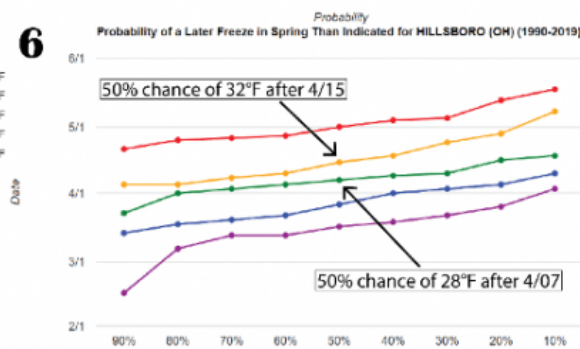
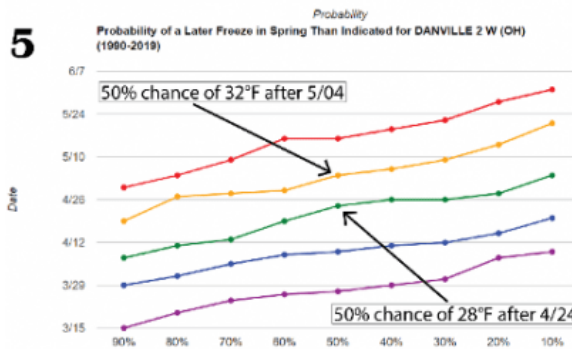
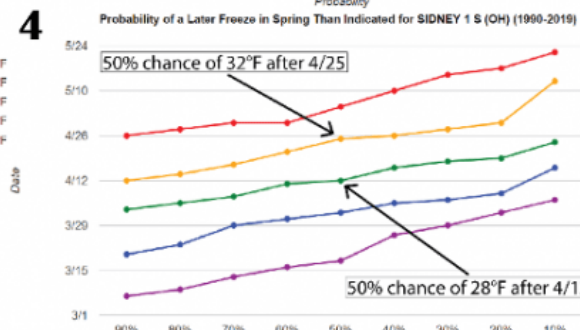
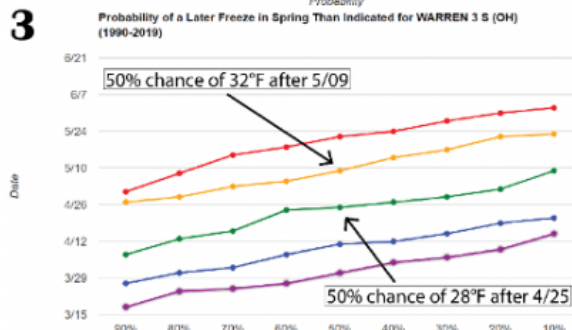
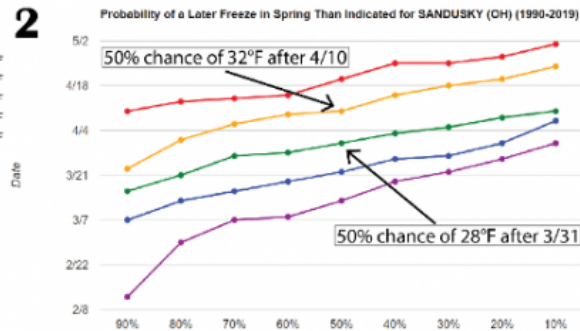
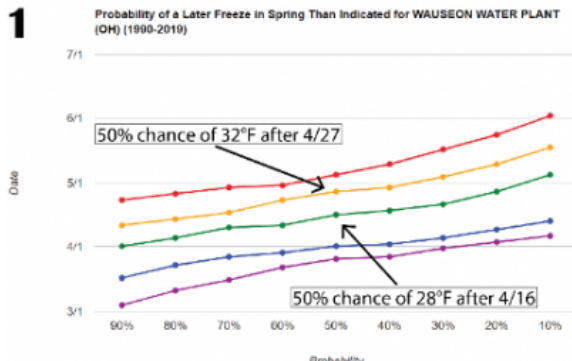


Figure 3: Probability of a later freeze in the spring for various locations (Fig. 2) around Ohio. Graphs generated by the Midwest Regional Climate Center (<http://mrcc.illinois.edu>).

Let's run through an example of how to use Figure 3. For *I-Wauseon*, we see that there is a 50% climatological probability of experiencing a 32°F temperature (yellow) after April 27, and this probability decreases to 20% by May 10. The colder, more damaging temperature of 28°F occurs 50% of the time after April 16, with only a 20% chance of seeing 28°F after April 27. For a southern location like *8-Marietta*, these dates occur earlier in the season. Here, there is a 50% climatological probability of experiencing a 32°F temperature after April 18 with 28°F occurring 50% of the time after April 2.

Besides latitudinal (north of south) position, what other factors can influence springtime minimum temperatures? Colder air is more dense than warmer air, meaning it wants to remain close to the ground and will flow over the terrain like a fluid to settle in areas of lower elevation. If your location is in a valley or low-lying area, the climatological dates will likely be shifted later to account for more freeze potential later in the spring. Water bodies are typically colder than the surrounding land areas in spring which may keep temperatures in the immediate vicinity a little colder. For 2020, water and soil temperatures are above average, so they are likely to have a moderating impact this year. Cloud cover and higher humidity in the spring will keep air temperatures warmer due to their absorption of terrestrial (from the surface) radiational effects. Finally, late season snowfall combined with clearing skies overnight can also cause the surface to cool rapidly and lead to damaging freeze potential as well. All of these factors should be considered when comparing your location to those selected in Fig. 3.

April 2020 Outlook

At the time of this writing, the National Oceanic and Atmospheric Administration (NOAA) Climate Prediction Center (<https://www.cpc.ncep.noaa.gov/>) outlook for April 10-20, 2020 calls for increased probability of seeing below average (unseasonably cold air) settling into the Upper Great Plain, Midwest, and Ohio Valley (Fig. 4) with a moderate risk of experiencing much below average minimum (nighttime) temperatures. Given the warm start to the year and current phenological conditions, those with horticultural assets should monitor this freeze potential closely and be prepared to mitigate when necessary to avoid losses. For a weekly climate update, please visit the State Climate Office of Ohio's website (<https://climate.osu.edu>).

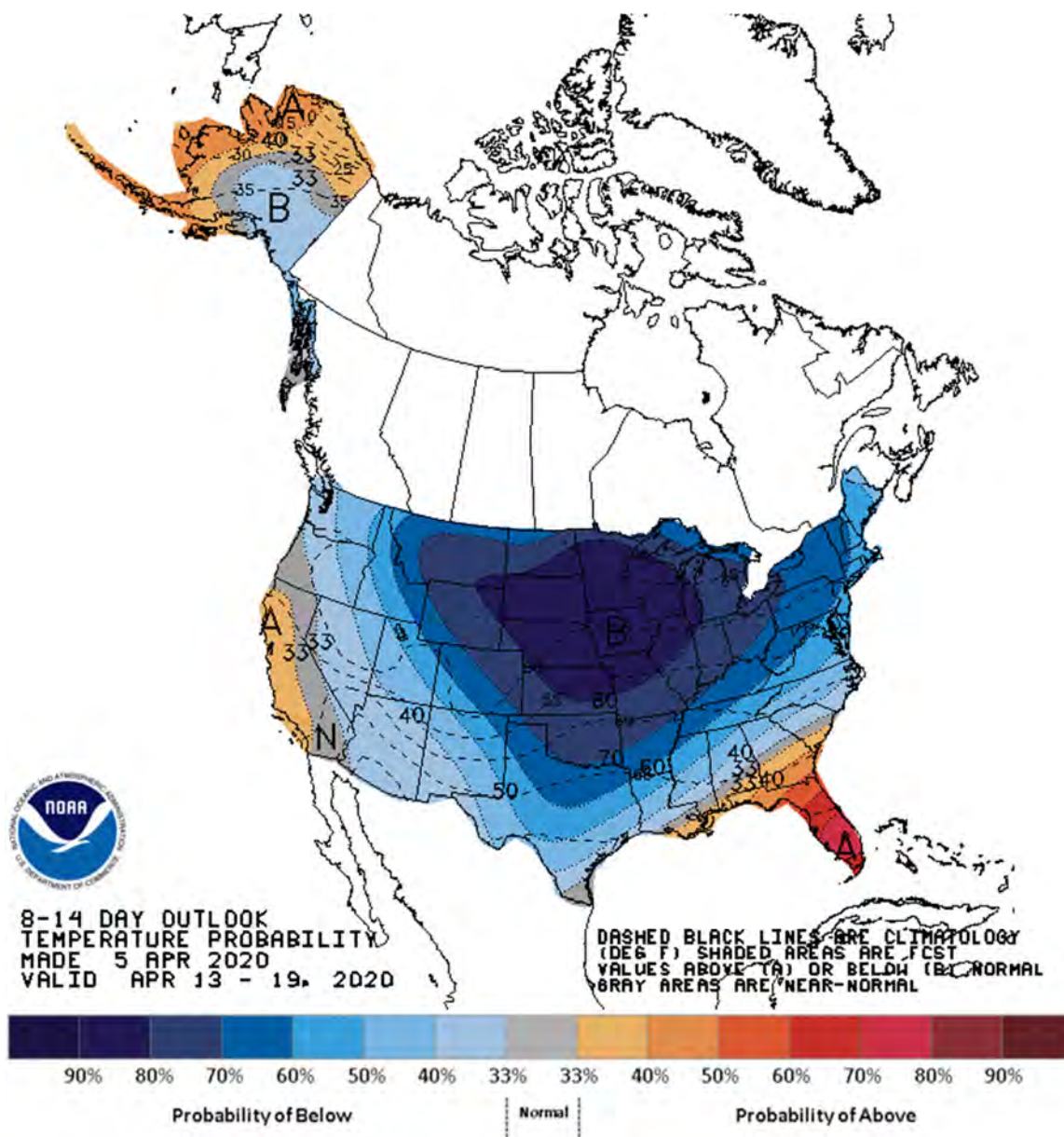


Figure 4: 8-10-day (April 13-19, 2020) temperature outlook. Figure courtesy of NOAA's Climate Prediction Center.

Aaron Wilson is a research specialist with the Byrd Polar & Climate Research Center and a climate specialist with the Department of Extension. You can also follow Aaron on social media: @dwweather-Facebook or @drwilsonsWx-Twitter.

BYGL

There are additional articles that I did not include. To see them go here: <https://bygl.osu.edu/>

April 2020 is our FIRST Ohio Native Plant Month and the 50 Anniversary of Earth Day!

AuthorsJulie Crook**Published on**

April 9, 2020



On July 18, 2019, Ohio Governor Mike DeWine signed House Bill 59 into law designating the month of April as Ohio Native Plant Month. This legislation makes Ohio one of the first states in the country to have an entire month dedicated to our native plants!

The COVID-19 virus has cancelled all group activities across Ohio, though there are still things you can do to participate in Ohio Native Plant Month. These activities for you and your families to share during these difficult times can be found at the following website: <https://www.ohionativeplantmonth.org/whats-planned>.

A Great List of Ohio Native Plants for Gardeners can also be found on their website. This list was recently compiled by Hope Taft and Debra Knapke (Jan 20, 2020) and is based on Robert Henn's book, *Wildflowers of Ohio*. Hope and Debra expanded Henn's list to include many of the native plant species found in the Heritage Garden at the Ohio Governor's Residence: <https://www.ohionativeplantmonth.org/native-plant-list>

Ticked off by Ticks, Part 2

Authors

Ashley Kulhanek

Published on

April 9, 2020



Christine Gelley, OSU Extension

Tick Awareness is important. **In part 1**, we covered the tick reports received that week: American Dog Tick and Deer Tick. Today, we will dive deeper into other the other medically important tick, the Lone Star Tick (*Amblyomma americanum*). While I haven't received a report of them yet this year, don't count them out.

LONE STAR TICK

The Lone Star Tick, as other ticks, is a blood-feeding, parasitic, 8-legged arthropod. Lone Star Tick gets its name from the white/yellowish dot on the female tick's reddish-brown scutum (back plate or shield). Males lack this spot but do have lighter markings along the margin of the body. (I unscientifically think it looks like a pie crust pattern.) These ticks may be described as more round in shape compared to the oblong shape of American Dog Tick or Deer Tick bodies. Alas this is subjective as ticks may appear in various sizes and shapes as they feed and grow. At 3/16 inch long they are similar in size to the American Dog Tick, yet are larger than Deer Tick.












OHIO STATE UNIVERSITY EXTENSION


Tick ID

Tick Identification and Disease Information

Ticks are blood-feeding parasites that may infect people and pets with diseases. Tick attachment for at least a day is necessary for disease transmission. For more information: u.osu.edu/tick.

Photos courtesy of Tick Research Lab, Texas A&M University.

<p>Actual Size</p>  <p>2–4 mm unfed</p>	<div style="background-color: black; color: white; padding: 2px; text-align: center; font-weight: bold;">Black-Legged 'Deer' Tick</div> <p><i>Can transmit Lyme Disease (most often by the nymph stage), Anaplasmosis, Babesiosis</i></p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="display: flex; justify-content: space-around; font-size: 0.8em;"> Male Female </div>
<p>Actual Size</p>  <p>1.5–7 mm unfed</p>	<div style="background-color: black; color: white; padding: 2px; text-align: center; font-weight: bold;">American Dog Tick</div> <p><i>Can transmit Rocky Mountain Spotted Fever</i></p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="display: flex; justify-content: space-around; font-size: 0.8em;"> Male Female </div>
<p>Actual Size</p>  <p>2–6 mm unfed</p>	<div style="background-color: black; color: white; padding: 2px; text-align: center; font-weight: bold;">Lone Star Tick</div> <p><i>Can transmit Ehrlichiosis, Heartland Virus</i></p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="display: flex; justify-content: space-around; font-size: 0.8em;"> Male Female </div>



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AND ENVIRONMENTAL SCIENCES

OSU Extension Tick ID Cards are available from your County Extension Office or for purchase [online here](#).

Lone Star Tick may have once been associated with Southern states, but it is now found in Ohio and beyond. Here in Ohio, southeastern Ohio is a high density area. Their preferred habitat will involve shade. They can be found along uncut grassy roadsides, meadows as well as forested shrubby underbrush, near waterways and by animal dwellings, but shade is a common environmental preference regardless of where they dwell. Lone star ticks feed on most animals and can actually be dispersed while feeding on birds. However, some reports indicate birds are not a favorite host, with the exception of wild turkey. In some areas, Lone Star Tick is known colloquially as the Turkey Tick, due to its common use of wild turkey as a host. It also feeds heavily on white-tail deer. Depending on conditions, Lone star tick has a 2 years lifecycle in Ohio. Females die after laying eggs. Adult ticks can survive 8 months to 2 years without feeding.

Lonestar is not known to transmit Lyme, but can transmit other diseases such as Tularemia, Ehrlichiosis, Rocky Mountain Spotted Fever, and has been associated with Tick Paralysis among others. Remember that ticks can carry more than one disease organism and can transmit more than one disease while feeding. Lone Star Tick's claim to fame these days is the possible correlation between Lone Star bites and developing an immune response, or food allergy, to red meat in humans. This allergy, known as alpha-gal syndrome occurs in some people when their immune system reacts to a sugar in the tick's saliva while feeding. The [CDC website here](#) shares that more research is needed to determine with certainty the relationship between tick and syndrome. The [American Academy of Allergy, Asthma, and Immunology site here](#) does reference the Lone Star Tick as a possible source of the allergy. I am not a doctor nor an allergist but am sharing this information as a possible health consequence of Lone Star Tick feeding among the other medically-important diseases that can be spread by this and other ticks. As with all things medical, a doctor or allergist should be consulted for diagnosis and treatment.

Clearly, the potential consequence to human health exhibited by bites of any of our 3 medically important ticks emphasizes the importance of tick PREVENTION as these illnesses are preventable by reducing the risk of tick feeding in the first place.

PREVENT TICKS FIRST!

- Wear long pants and long sleeve shirts if entering tick habitats.
- Tuck pants into socks and shirts into pants to limit tick access to skin.
- The application of DEET insect repellents can help, at least 20-25% DEET is recommended.
- Permethrin-treated clothing is available to kill or repel ticks.
- Always do a TICK CHECK after returning from outdoor activity, especially tick-heavy habitats.



When it comes to permethrin-treatment, clothing can be purchased pre-treated from outdoor supply companies and usually last through several washes. You may treat your own clothing with appropriately labeled products, following all label instructions. These products are NOT for skin-contact and labels must be consulted before choosing to treat your own clothing. Unlike repellents, if the tick remains in contact long enough with the treated clothing, it can die or suffer ill-effect.

So what do you do if you find an attached tick? First, please avoid folk-remedies for removing ticks. The best strategy is to use tweezers or a tick-removal tool to grasp the tick as close to the skin as possible near its mouthparts. Pull straight outward with steady even force. The primary goal is to remove the tick as soon as possible. The longer it remains attached, the higher the risk of disease transmission. After removal, clean and disinfect the site and **SAVE THE TICK!** Your doctor may wish to have it identified or tested.

The Extension Office in your county is an excellent resource for tick and insect identification. During this period of social distancing, physical Extension Offices are closed at the time of this posting. **HOWEVER!** We are still here for you! Extension Educators are working virtually and are able to answer your questions or identify insects and ticks by photo sent to your county educator's email, sent to one of the writers on BYGL, or through **ASK AN EXPERT** at <http://extension.osu.edu/ask-an-expert>.

For more information on these and other ticks, check out the [OSU Factsheet on ticks](#).

TICKENCOUNTER.ORG through the University of Rhode Island is the ultimate resource for all things ticks including detailed photos of all stages of tick development. Check them out!

As with any tick bite, contact your medical provider to discuss concerns, whether treatment is necessary or other plan of action. Extension Educators are not medical professionals and are not able to discuss treatment or disease management related to ticks or other arthropod-vectored diseases.

More Information

Ticks and Tickborne Diseases, OSU Factsheet

<https://ohioline.osu.edu/factsheet/HYG-2073>

Lone Star Tick, UFL

http://entnemdept.ufl.edu/creatures/urban/medical/lone_star_tick.htm

Lone Star Tick in Kentucky

<https://entomology.ca.uky.edu/ef648>

Name That Pathogen

AuthorsJim Chatfield**Published on**

April 9, 2020



Jim Chatfield, OSUE

“Pathogen” from the Greek *pathos* and *gen* for “born of” is a word for a causative agent of infectious disease. There are pathogens that cause infectious diseases of animals (including us), of plants, and even of unicellular organisms such as bacteria and archaea. Viral pathogens of bacteria are called bacteriophages, the “phage” part from the Greek *phagos*, “to feed on”.

Human pathogens include microorganisms such as bacteria, fungi, and unicellular protists such as the *Plasmodium* species that cause malaria. Viruses are an outlier of a pathogen, since most biologists do not consider them to be living organisms. Plant pathogens include certain fungi, oomycetes, bacteria, nematodes, protists such as the club-root pathogen of crucifers, and even parasitic plants, such as dwarf mistletoe and dodder.

The first documented usage of the word “pathogen”, at least according to several sources I checked, was in 1880. a historical note of interest to us right now, is that much of what we know now was just developing then: e.g. the H1N1 virus that is the pathogen for the “Spanish” flu was particularly hard to understand in 1917-1919.

At that time no-one was able to visualize viruses, as electron microscopes did not exist for these tiny substances. Viruses had not yet been crystallized. The structure of the DNA and RNA of viruses (surrounded by a protein coat) was not known. More on this later. For now, let us take a brief look at some familiar and not so familiar animal and plant diseases and what type of pathogens are involved in these diseases. Let’s put our current crisis to educational use. See also:

<https://bygl.osu.edu/index.php/node/1477> “Point Counter Point; Dutch Elm Disease”

<https://bygl.osu.edu/index.php/node/1454> "Infectious Disease Host Range"

<https://bygl.osu.edu/index.php/node/1450> "Pathogen vs. Disease: Why Terms Matter"

YOUR HUMAN DISEASE PATHOGEN QUIZ FOR TODAY: For how many of these diseases did you know the types of pathogens involved?

Disease – COVID-19. Pathogen – Virus: SARS-CoV-2.

Disease – Chickenpox and Shingles. Pathogen – Virus: Varicella-zoster virus. On a personal note, I am just short of five years in from a shingles breakout in my trigeminal nerve and just now off finally finishing my medication treatment. My thoughts: Strongly consider, with your doctor, the shingles vaccine.

Disease – Smallpox. Pathogen – Virus: Variola virus.

Disease – Strep Throat. Pathogen – Bacterium: - *Streptococcus pyogenes*.

Disease – Tuberculosis. Pathogen – Bacterium: *Mycobacterium tuberculosis*.

Disease – Bubonic Plague. Pathogen - Bacterium: *Yersinia pestis*. Vectors: Here is a case where there are intermediate vectors involved in the disease. With the plague, it was rodents that harbored the virus that were then fed on by fleas that then transmitted the virus to humans.

Disease – Malaria. Pathogen - Unicellular eukaryotes (Protista). *Plasmodium falciparum* and other *Plasmodium* spp. Vectors: Another case where other organisms were involved; in this case, certain species of mosquitoes in the genus *Anopheles*.

Disease – Toxoplasmosis. Pathogen - Unicellular eukaryote: *Toxoplasma gondii*.

Disease – Meningitis. Pathogens - The type and the pathogenesis depends upon the type of pathogen that attacks the meninges (membranes that surround the brain and spinal cord); thus there is the particularly serious bacterial meningitis (treatable with antibiotics) and viral meningitis, which since viruses are not living are not controlled directly by antibiotics.

Disease – Athlete's foot. Pathogen – Fungus: *Trichophyton* spp. and other genera. There are typically not too many serious fungal diseases of humans. One fungal disease, generally not that serious is Athlete's foot. Another less common fungal disease, and potentially much more serious is rose-gardener's disease (<https://bygl.osu.edu/index.php/node/1450> "Pathogen vs. Disease: Why Terms Matter"; <https://bygl.osu.edu/index.php/node/1468> "BYGL Mailbag")

There are also fungal infections of humans that come into play with compromised immune systems, such as when drugs are used to suppress the immune system and with diseases such as AIDS (Acquired ImmunoDeficiency Syndrome, caused by the Human Immunodeficiency Virus HIV).

There are of course many more examples:

Viral diseases including the common cold caused by coronaviruses and other viruses to the viruses that causes yellow fever, polio, and rabies.

Bacterial diseases from Lyme disease caused by *Borrelia burgdorferi* and vectored by deer ticks that were on deer, mice, mammals, and birds, to the venereal disease gonorrhea (*Neisseria gonorrhoeae*).

Fungal diseases from fungal nail infection to thrush caused by the yeast fungus, *Candida albicans*.

And on and on, "Nature red in tooth and claw", and a reminder that disease is, though certainly something we think of as an aberration, truly natural.

And now, for your PLANT DISEASE QUIZ FOR TODAY, starting with the first virus ever fully identified.



Jim Chatfield, OSUE

Tobacco Mosaic Virus disease symptoms. From burleytobaccoextension.ca.uky.edu

Disease: Tobacco Mosaic. Pathogen – Virus. A Tobamovirus: TMV, causes a mosaic pattern on leaves of tobacco, with decline of plants and serious economic losses, and other plants in the Solanaceae (nightshade family) and other host plants. Unlike many plant viruses, that are vectored by aphids and nematodes, TMV is

mechanically transmitted via worker's hands, tools, clothing, and even tobacco products. Thus, horticulturists working in tomato and ornamental plant greenhouses were often considered *persona non grata* if they were smokers.

TMV was shown to be infectious in 1892 (by Dmitry Ivanovsky) as a substance that passed through tiny filter pores remained infectious to tobacco plants, even though the filters would not allow bacteria to pass. In 1908, Martinus Beijerinck called the substance a "virus", and the study of virology was born.

No one could visualize this substance though, even with the most powerful light microscopes. Then Wendell Meredith Stanley was the first to crystallize a virus - TMV - in 1935, and for this and other work he shared a Nobel Prize in Chemistry in 1946. He thought the virus was pure protein, which later proved not to be the case: viruses consist of RNA or DNA with a protein coat.

But hey, give him a break, though DNA was synthesized back in the 1860s by Friedrich Miescher, its double helix structure was not elucidated by Watson and Crick until 1953. And the visualization of viruses did not occur until 1939 when Ernst Ruska and Max Knoll, using the new electron microscope Ruska developed for this PhD thesis (not bad!), used it to visualize TMV particles.

So Stanley stood on the shoulders of giants, but as is the case for all scientists, other giants extended their part of the ever-improving, constantly changing understanding of nature, the goal of science.

Why was it so hard to discover TMV and subsequently other viruses, including SARS-CoV-2? Well TMV is a rod-shaped virus, 300 by 18. 300nm by 18nm that is: and a nanometer (nm) is one-billionth of a meter. As in .000000001 meter long. So it took a while for *Homo sapiens* to develop a microscope to find something .000000300 meters long.

By the way, coronaviruses are spherical, with club-shaped spikes on the surface, and the size of each particle is within a range, but in one paper describing virus particles from a Korean patient early in the epidemic (which became a pandemic) the size of SARS-CoV-2 was reported as 70-90 nm. So again, tiny, as in .000000070-.000000090 meters in size.



Jim Chatfield, OSUE

Now we are really getting serious. Virus symptoms on crabapple! Just kidding - there are - possibly - more important things in life

Disease: Impatiens Necrotic Spot Virus Disease. Pathogen – INSV. This is a case where the host range of the disease is very wide, hundreds of host plants, from peppers to peppermint. This was a major disease for years, requiring in some cases destruction of entire greenhouses full of plants. Western flower thrips insect is a vector. One of the diagnostic dilemmas of this disease is the range of symptoms: from discolored spots to leaf curling, from stunting to stem dieback. There were many plants with no visible symptoms that were carriers and yet causing damage, such as subtle stunting, making management a major problem for the green industry.

Disease: Rose Rosette Disease. Pathogen – Rose rosette virus. This virus is vectored by a tiny eriophyid mite (*Phyllocoptes fructiphilus*)



Jim Chatfield, OSUE

Rose rosette disease



Jim Chatfield, OSUE

In the summer of 2016 the historic rose gardens at the Fort Worth Botanic Gardens were gone due to rose Rosette Disease



Jim Chatfield, OSUE

The Rose Garden evolution at OSU's Secret Arboretum

Disease: Dutch elm disease - Pathogen: Fungus: *Ophiostoma ulmi* and *Ophiostoma novo-ulmi*. Vectors: Elm bark beetles. Of course this disease transformed the urban forests of many American towns.

Disease: Plum black knot. Pathogen – Fungus. *Apiosporina morbosa*.



Jim Chatfield, OSUE

Plum black knot, caused by *Apiognomonia morbosum*. Picture actually taken by Joe Boggs and stolen by me.

Disease: Late blight of potato. Pathogen - Oomycete (*Phytophthora infestans*). This is one of the most important historical, and still ongoing, plant diseases. When it became epidemic in Europe and the British Isles in the mid to late 1840s, the germ theory of disease had not been elucidated; Pasteur and Koch's germ theories were decades to come.



Jim Chatfield, OSUE

Actually not my drawing. From Google

It was a puzzle at first as to whether the fungal-like growth on the dying foliage and the rotting tubers was saprophytic (living on dead organic matter) and thus an effect, or parasitic (feeding on living organic matter, and thus the cause of the problem).



Jim Chatfield, OSUE

This I did take. At the very meaningful Irish Hunger Garden in Manhattan. If you visit you will see that the Statue of Liberty is off to the south. At the entrance to the Garden are panels from *Advance of the Fungi*

The contemporary dilemma during the outbreaks of this disease is encapsulated from reports of what became known as one of the causes (along with a broken tenant farmer system in Ireland) of the Irish Potato Famine. These contemporary reports in *The Gardener's Chronicle* and the *Agricultural Gazette* in 1845 are fascinating.

One day, you can read them as I did in the Horticultural Society of New York Library at 148 W 37th St in Manhattan Or check it out in the book "Advance of the Fungi" (1940) by E.C. Large. Here are a few excerpts from "Advance of the Fungi":

" 'A fatal malady has broken out amongst the potato crop. On all sides we hear of the destruction. In Belgium the fields are said to have been completely desolated. There is hardly a sound sample in Covent Garden Market.' So began the first warning of a calamity, in the editorial columns of *The Gardeners' Chronicle and Agricultural Gazette*, on August 23rd, 1845."

"Nothing was known of the course that the disease would take; the potatoes were rotting in the ground--not everywhere, but in a pestilence so universal why should any be spared? It was suggested that the rot might be caused by static electricity--generated in the atmosphere by the issuing puffs of smoke and steam from the hundreds of railway locomotives that had recently come into use, and for all that was surely known it might equally

well be due, as others supposed, to mortiferous vapours or 'miasmas' rising from blind volcanoes in the interior of the earth.

They were at a great disadvantage then. Now we know about infectious disease, and pathogens, yet still we need to relearn many of the lessons when disease comes to call.



even Stephen Colbert gets into phytopathological education. Again a Google photo

Disease: Fireblight of pear. Pathogen – Bacterium. *Erwinia amylovora*.



Jim Chatfield, OSUE

Fireblight of Callery pear. Classic "shepherd's crook" symptoms



Jim Chatfield, OSUE

Now its getting serious. Fireblight on crabapple

Disease: Crown gall of stone fruits and many other hosts. Pathogen: - Bacterium: *Agrobacterium tumefaciens*.



Jim Chatfield, OSUE

Crown gall on euonymus



Jim Chatfield, OSUE

Crown galls may be quite large

Disease: Bacterial wilt of cucumber. Pathogen – Bacterium: *Erwinia tracheiphila*. Vectored by spotted and striped cucumber beetles.

Disease: Elm yellows/Elm Phloem Necrosis. Pathogen – Bacterium (classified previously as a Mycoplasma-Like Organism, then as a Phytoplasma, currently as a wall-less bacterium). Elm yellows bacterium is vectored by leafhopper insects. This disease is thought by many to be as serious over the years in certain parts of the country as Dutch elm disease.



Yellowed leaves from elm yellows. The pathogen is in the phloem, so tree health goes downhill from here.

Disease: Club root of cabbage and other crucifers. Pathogen – Phytomyxea, a Protist group: *Plasmodiophora brassicae*. Once classified as a slime mold. The most evocative name, though, for this disease with contorted roots is the older name of - cabbage hernia.

Better yet is the saying by plant pathologist Antonin Woronin, speaking in the late 1800s of the lack of controls for the disease, other than the burning of infected plant debris at the end of the harvest: “*The only cure for cabbage hernia is - Fire!*”. What a saying, although from personal experience I do not recommend yelling this at the top of your lungs when teaching a plant pathology class in a crowded building.” With that final word, people came a ‘runnin’.

Disease: Root knot. Pathogen – Plant-parasitic nematode. *Meloidogyne incognita* and other *Meloidogyne* species.

Disease: Dwarf mistletoe. Pathogen – Parasitic plant. *Arceuthobium* species. This true parasitic plant with virtually no capability of producing its own food, differs from our eastern half-parasites, the true mistletoes (native *Phorodendron* spp. And non-native *Viscum* spp.), that have both green leaves and send suckers down into plant tissue for nutrition.



Dwarf mistletoe in New Mexico



One last disease: the unusual plant pathogen, a parasitic plant, dodder (*Cuscutas*) parasitizing, hurray, a problematic invasive plant, Japanese knotweed

So, at long last the end of this article, though not of human or plant diseases. Let us close with a quote from the phytopathological end of the equation, demanding the need for integrated plant health management, for the importance of a complex understanding of the problem.

A plea for considering all avenues of management, in the case of plant diseases, for more than just the spraying of fungicides. (see: <https://bygl.osu.edu/node/949>. "Disease Demystified".)

[The control of plant disease] "*must be more than squirt gun botany.*" – J.C. Arthur.



Jim Chatfield, OSUE

Oh, one last image: another dwarf mistletoe. This time from Arizona! Nature is ever inventive. 24/7.

Be on the Lookout for Wild Parsnip!

Authors

Joe Boggs

Published on

April 9, 2020



Wild parsnip (*Pastinaca sativa* L., family Apiaceae (= Umbelliferae)) plants are now large enough to be readily identified in southwest Ohio. This Eurasian native grows as a biennial in Ohio requiring two seasons to complete its life cycle.





Plants spend the first year as rosettes with leaves confined to growing from a short stem near the ground. While in this stage, the plant produces a long, thick taproot. Flower stalks rise from overwintered rosettes during the second year. Leaves are alternate, pinnately compound, branched, and have saw-toothed edges. Each leaf has 5 -15 ovate to oblong leaflets with variable toothed edges and deep lobes.



Second-year plants can grow to impressive heights topping 8'; however, most mature plants range in size from 4 - 6'. Mature plants will produce a single, thick, deeply grooved, greenish-yellow stem that sprouts lateral branches topped with hundreds of clusters of the umbellate flowers. Plants are prolific seed producers meaning that small patches of this weed can develop into large patches in just a few years.

Wild Parsnip Flowers



Joe Boggs, OSU Extension©

Wild Parsnip Plant



Joe Boggs, OSU Extension©



Wild parsnip has become increasingly common in recent years in Ohio landscapes and fields. Reasons behind the ever expanding distribution and rapid expansion of infestations are not entirely understood. However, it is clear that the proliferation represents an increasing risk to both people and animals.

Wild Parsnip: Large Infestation



**Wild Parsnip - Blooming
Heavy Infestation**



Avoid Contact

Landscape managers and gardeners should exercise extreme caution around this non-native invasive plant. Wild parsnip sap contains psoralen which is a naturally occurring phytochemical grouped in a family of organic compounds known as linear furanocoumarins. Psoralen acts as a photosensitizing compound by inhibiting DNA synthesis in epidermal cells which kills these light-shielding cells responsible for protecting us from long-wave ultraviolet radiation (LWUVR) bombarding us in sunlight.

Severe blistering occurs when affected skin is exposed to LWUVR. The synergistic effect is called phytophotodermatitis (a.k.a. Berloque dermatitis) and the burn-like symptoms, as well as skin discoloration, may last for several months.



However, connecting skin blistering to exposure to wild parsnip sap can be a challenge. It takes around 24 hours for symptoms to first appear *after exposure* to LWUVR and severe blistering typically doesn't peak until 48 -72 hours. The time required for symptoms to appear after exposure to the sap means the effect may be disconnected from the cause.

Another challenge with connecting the dots is that wild parsnip commonly grows in and around other weeds, particularly poison hemlock (*Conium maculatum*) which is another member of the Apiaceae family. This deadly non-native biennial weed contains highly toxic piperidine alkaloid compounds which cause respiratory failure and death in mammals.



The poison hemlock toxins have a completely different mode of action and must be ingested or enter through the eyes or nasal passages to induce poisoning; they do not cause skin rashes or blistering. However, gardeners exposed to wild parsnip growing among poison hemlock may mistakenly blame the poison hemlock for their ultimate misery.



Psoralens are also found in a number of other members of the Apiaceae family including the notorious giant hogweed (*Heracleum mantegazzianum*) which has captured national attention in the past. However, giant hogweed has only been confirmed in Ohio growing in the extreme northeast part of the state primarily in and around Ashtabula County. Wild parsnip is found throughout the state and is equally damaging. Of course, giant hogweed has a more threatening sounding common name; wild parsnip just sounds like a vegetable gone wild; which it actually is!

A Good Veg Gone Bad

Parsnips have been cultivated as a root crop in Europe for centuries; perhaps millennia. The "L." in the scientific name *Pastinaca sativa* L. means Linnaeus first described the species. Both the cultivated and wild types share the same scientific name; however, it is clear that there are significant differences in toxic biochemical properties, invasive behavior, and some morphological features between the two types.

Early taxonomic efforts treated the different types of parsnips as subspecies. More recent research has shown that while the subspecies designation may still be valid for some types of parsnips, the cultivated types have their roots in *varieties* which makes sense from both an evolutionary and agricultural perspective.

As with most of our agricultural crops, cultivated parsnips no doubt got their start through trial and error by our early ancestors. Indeed, wild types are still found in Europe and Asia just like wild potatoes are still found in South America.

It is now theorized that the wild parsnip plants in Ohio represent "escapes" from cultivated types brought to North American from Europe and a "reversion" back to a wild type. The wild genes were always there but remained suppressed until revealed through natural selection.

For example, research on wild parsnip has shown that psoralen behaves as a *phytoalexin* which are plant defense compounds aimed at thwarting attacks by macro and microorganisms. Although the concentration of psoralen is inherently higher in wild types compared to cultivated parsnips, researchers found that the production of the plant toxin increases in wild types in response to wounding by herbivores imparting an obvious plant survival advantage.

On the other hand, a selective advantage is awarded to herbivores that can handle phytoalexins. Heavy damage by fourlined plant bugs (*Poecilocapsus lineatus*) will be a common feature on wild parsnips later this spring in Ohio.



The parsnip webworm (*Depressaria pastinacella*) focuses its entire attention on its namesake host. The webworm thwarts the plant's chemical warfare by excreting most of the plant toxin in their feces. However, some of the toxins are incorporated into the caterpillar's silk webbing. The purpose is unknown, but it is speculated that the toxins provide protection against predators and parasitoids as the caterpillars feed on the flower parts. Unfortunately, wild parsnip is so prolific that damage by the caterpillars provides little relief from the continual spread of this vegetable gone wild.



Mechanical and Chemical Control

The extreme skin reaction to the wild parsnip sap means this non-native invasive weed should not be allowed to grow where it can be easily contacted by people. However, mechanical control is problematic. Hand-pulling is a

high-risk endeavor and not recommended. Likewise, tilling would release a huge amount of harmful sap. There have been reports of sap spattered by mowers and string trimmers producing phytophotodermatitis on exposed arms and legs of equipment operators.

**Wild Parsnip - Mature Plants
High Risk Location**



**Wild Parsnip
High Risk Position**



The safest approach to controlling this invasive weed is to use herbicides. Of course, as always, read and follow label directions paying close attention to recommended rates and whether or not surfactants are recommended to enhance herbicide efficacy.

Wild parsnip plants are susceptible to a number of selective and non-selective postemergent herbicides. However, keep in mind that non-selective herbicides such as glyphosate (e.g. Roundup) can also eliminate plants that compete with wild parsnip.

Herbicidal openings produced by non-selective herbicides provide perfect opportunities for more wild parsnip to spring forth from previously deposited seed. Thus, it's important to have a plan for establishing competitive plants after the wild parsnip dies off such as over-seeding with grasses.

Selective post-emergent herbicides will preserve competitive plants. Herbicides effective against wild parsnip include 2, 4-D, clopyralid (e.g. Transline), and metsulfuron (e.g. Escort XP).



Treemergency: Mulch Volcanos are Erupting in Landscapes!

Authors

Joe Boggs

Published on

April 8, 2020



Mulch piled to stratospheric heights around tree trunks has been called many things (some not printable) such as *pyramid mulch* and *mountain mulch*. My personal favorites are *mulch volcanoes* (or volcano mulch) for stratovolcano-like creations and *mulch mounds* for those that resemble shield volcanoes.





These mulch monstrosities have been a source of continual frustration for anyone who cares for trees or cares about trees. Yet, despite years of educational efforts, we just can't seem to stamp out the abominable practice.

Adding insult to injury (or the coup de grâce), mulch volcanoes are often accompanied by "tree moats" created by excavating a moat-like ring around trees or shrubs at about the dripline, or slightly beyond. This is done with an edger or a shovel. In either case, there always appears to be a concerted effort to sever roots growing beyond the excavation zone.

"Tree Moat"



Joe Boggs, OSU Extension©

**Roots Damaged
in Tree Moat**



Joe Boggs, OSU Extension©



Why do these horticultural horrors appeal to people? Tree moats take extra time. Mulch volcanoes cost more money. Both can cause slow tree death. Perhaps that's the problem: they don't kill trees right away!

Leave it to the Bard to provide the perfect metaphor in *"King Henry VI Part III"*, Act 2 scene 1:

*"And many strokes, though with a little axe,
Hew down and fell the hardest-timbered oak."*

Volcano mulch and tree moats are little axes.



Mulch Done Wrong

Volcano mulch does not kill trees outright; if it did, people wouldn't do it. Instead, it produces subtle, long-term, ill-effects that are mostly hidden from our view.

- 1. Bark Damage:** Tree bark is dead, dry tissue that protects trees from a wide range of challenges such as dehydration, oxidation, and direct access by plant pests and pathogens to the living tissue beneath. Mulch piled against tree trunks can retain water elevating the moisture content of the bark making it susceptible to decay. The result is analogous to what happens if we suffer severe skin damage.
- 2. Root Dehydration:** Although bark mulch may at first appear light and airy, it ultimately becomes compacted as it degrades to interfere with oxygen reaching tree root cells. Trees respond by growing a secondary root system into the mulch; it's the same response seen in trees planted too deep in the soil. However, the roots growing into the mulch can become exposed and dehydrate as old mulch eventually degrades and disappears.

**Tree Roots Exposed
After Mulch Decomposes**



3. Stem Girdling Roots: Secondary roots growing into mulch piled high on the trunk will encounter the slopes of mulch volcanoes causing the roots to turn; they can't grow into thin air! Eventually, these roots encircle the tree trunk and merge with the stem tissue. As these errant roots increase girth, they gradually girdle the trunk and restrict vascular flow. Thus, they are known as "stem girdling roots."

**Stem Girdling Roots
Induced by Volcano Mulch**



4. No Water Infiltration: As the organic mulch decomposes and dries out, it will eventually start to repel water; it becomes hydrophobic. You can observe hydrophobicity of dry organic matter when you try to moisten a bag of dry peat moss. Of course, water repellency ultimately causes infiltrating roots to dehydrate.

5. Tree Stress: The deleterious nature of volcano mulch is not immediately apparent. While moisture starvation and vascular strangulation can ultimately kill a tree, along the way they produce tree stress. This can induce trees to drop their defenses against infestations by opportunistic insect pests such as native borers or infections by plant pathogens. Of course, the pests and diseases get blamed if a tree succumbs, not the volcano mulch that set into motion the tree's demise in the first place.

The Flatheaded Appletree Borer (*Chrysobothris femorata*, family Buprestidae) is a good example of a native borer that attacks stressed native and non-native trees. Despite its common name, this borer attacks a wide range of trees including maples and other hardwoods.





Mulch Done Right

Organic mulches such as aged bark mulch are a wonderful thing. The mulch moderates soil temperature, preserves soil moisture, suppresses weeds, and as the organic mulch slowly decays, it contributes to the organic content of the underlying soil. If used properly, the dark colors enhance landscape aesthetics. Of course, the availability of organic mulch dyes make other colors available; shopping for mulch can be like using an artist's palette.

In 2017, I highlighted an outstanding example of tree mulching in Glenwood Gardens, Great Parks of Hamilton County (GPHC) ("*Glenwood Gardens: A 'Volcano' Mulch-Free Zone*"). I'm including a few of the images from that Alert or you can read the entire report by clicking this hotlink: <https://bygl.osu.edu/node/721>

Proper Use of Mulch Around Trees Glenwood Gardens



Joe Boggs, OSU Extension©

Jerry Frankenhoff (Urban Forester, GPHC) told me that the mulch job was performed by a group of volunteers from General Electric. They worked with staff members from the GPHC landscape department to apply 60 cubic yards of mulch in Glenwood Gardens and Winton Woods on Earth Day.

Their application of mulch followed all of the general recommendations for using hardwood mulch around trees. The mulch rings were as large in diameter as practical and mulch depths were no more than 2 - 3 inches. Mulch that found its way onto the tree trunks was pulled away from the trunk flare. What a fantastic Earth Day statement!



My Forsythias are shaped beautifully.....but few flowers!

Authors

Thomas deHaas

Published on

April 7, 2020



Deciduous trees and shrubs can produce a dependable flower show, but the flower buds that create the flowers need to be kept in consideration to prevent damage. Pruning at the wrong times can be a major reason for the reduction in flowers.



In addition, early blooming plants like Saucer and Star Magnolias can be burned by a heavy frost.



On a recent walk in the neighborhood, I commented on how pretty and full the forsythias looked this year.





Then I happened upon this hedge of forsythias. Great shape, few flowers...and I was reminded of an important cultural practice related to pruning.



In most cases, the time to prune flowering trees and shrubs to insure the best flower show is right after they flower. If you wait too long to prune, you may be removing next year's flower buds. These plants include Forsythia, Deutzia, Ninebark, Sweet spire, Rose of Sharon, Fothergilla, and Weigelia to name a few. Another aspect of flowering plants is their time of flowering. Some of the early flowering forms of Magnolia can have flowers burned after a heavy frost.





These include Star Magnolia



and Saucer Magnolia.



The plant is fine but the flowers will turn brown. Some flowering Magnolias have been cultured to flower later in the spring helping to preserve the buds. These include *Magnolia* x '*Betty*', *Magnolia* x '*Ann*', and *Magnolia* x '*Butterflies*'.



These bloom later and have less chance of injury.
The lesson to be learned, "Preserve the flower buds...Enjoy the flowers!"

Virtual Programming with OSU Extension, Agriculture and Natural Resources Program Area

Authors

Amy Stone

Published on

April 6, 2020



Some information included in this BYGL Alert was taken from a CFAES News Release, *Agriculture & Natural Resources Madness - Tournament of Education* posted on April 2, 2020.

Did your usual conference or class get canceled? Are you looking to fill the void during this time of social distancing and the stay-at-home order? Ohio State University Extension is here to help with a new virtual education program for the agricultural community - including programming in agriculture, natural resources and horticulture.

“Agriculture and Natural Resources Madness: A Tournament of Education” will include 64 educational events broken into daily brackets. Each day, a virtual educational session will be held at 9 a.m., noon, and 3 p.m. The educational tournament is free of charge and will likely continue until mid-May.

“This effort is a direct response to providing a variety of useful and timely sessions for farmers and families across the state during Gov. DeWine’s stay-at-home order,” said Jacqueline Wilkins, interim director of OSU Extension. “While our ‘tournament’ is being loosely tied to March Madness, it’s not a competition, and people can join in at any time for as many or as few sessions as they desire.”

The tournament opened on Wednesday, March 25, with some more traditional topics in the field of agriculture. All the sessions have been, or will be recorded, just in case the live timing doesn't work for our viewers. Tuesday's in April have been "tagged" horticulture days, with sessions at 9:00 am, 12:00 pm and 3:00 pm. Here is the tomorrow's schedule:

Tuesday, April 7th

- 9:00 am - Invasive Species Update, Amy Stone, OSU Extension, Lucas County
- 12:00 pm - The Basics of Soil Testing and Plant Nutrition for the Public, Ann Chanon, OSU Extension, Lorian County
- 3:00 pm - BYGLive! - Ornamental Horticulture Updates, Carri Jagger, OSU Extension, Morrow County and Amy Stone, OSU Extension, Lucas County



Gypsy Moth Adults and Egg Mass, Photo Credit: Amy Stone

Other upcoming topics this month include: Quick and Dirty Ohio Tree ID, Asian Longhorned Beetle Update, Awesome Annuals, Pesticide Safety, Gardening for Pollinators, Landscape Insects - Bagworms vs the Tent Builders, and a weekly BYGLive! Ornamental Horticulture Updates!

To find complete details on the tournament's educational opportunities and other event and webinar links, visit go.osu.edu/agmadness.

The daily topics will vary and were schedule to meet a wide range of interests within our diverse agriculture industry and are geared for producers, green industry professionals, woodland owners, gardeners and the public.. Topics will cover a variety of subjects and be presented in a variety of virtual platforms. When possible, question-and-answer opportunities will be included. Sessions are open to anyone - just look over the topics, and choose those of interest to you.

Agriculture and Natural Resources Madness is just one example of how OSU Extension is employing its online resources during this challenging time to remain engaged with Ohioans. "The intent is to reach the agricultural community in a time of high stress," Custer said. "OSU Extension has also updated its Ag Crisis website to include a toolbox of resources related to COVID-19. Those can be reached at go.osu.edu/AgCrisis."

OSU Extension has implemented a teleworking plan, and all OSU Extension offices statewide are closed until further notice. The plan mirrors The Ohio State University's decision to require all employees who can do so to work from home and to maintain only critical services on university property across all campuses.

Clients, stakeholders, and other community members can continue to connect with any OSU Extension staff member via phone or email as usual. To contact your local Extension office, visit for office phone numbers and a direct link to each office's website and staff directory. If you reach voicemail, please leave a message with your name and contact information, and you will be contacted as soon as possible.

More Information

The Full Bracket of Educational Opportunities

<https://agmr.osu.edu/events/agriculture-and-natural-resources-madness/full-brac...>

Mining Bees Can Cause Minor Panic

Authors

Joe Boggs

Published on

April 4, 2020

Mining Bee Burrow



Joe Boggs, OSU Extension©

Last week, I came across one of the largest collections of soil "mining bees" that I've ever seen in Ohio. The "colony" was located in a picnic area and numerous males were making their low-level flights in search of females. The sparse turfgrass coupled with early-evening lighting made conditions perfect for taking pictures.

Location of Large Mining Bee "Colony"



Joe Boggs, OSU Extension©

Unfortunately, the colony's location made me worry for the safety of the busy bees. Misplaced fears can make these important native pollinators targets of misinformed insecticide applications.

There are multiple species of bees representing a number of families that create individual (solitary) burrows in the soil; however, there is a high probability that burrowing bees found in Ohio belong to the genus *Andrena* (family Andrenidae) with over 100 species living in our state. Many of these species have prominent banding on their abdomens which is even visible in flight.





Bee Aware:

These native pollinators are typically 3/16 - 3/4" long, depending on the species, and have banded abdomens. Females dig individual burrows several inches deep into the soil. They prefer to nest in well-drained soil that is lightly exposed to sunlight. This includes areas in landscaping with sparse vegetation such as openings created by weakened turfgrass.



Each burrow consists of a hole about the diameter of a wooden pencil surrounded by a mound of loose, excavated soil particles. The loose soil particles can disappear after a heavy rainfall leaving only the hole. The size, shape, and color of the soil particles may cause the mounds to be mistaken for those produced by ants or even earthworms.





Mining bees are considered solitary bees with no social structure. However, large numbers of females often locate their burrows in close proximity to one another giving the appearance of an organized colony. The collective nesting behavior may be associated with maximizing the chances for males to find and mate with females.



The females become receptive to mating after they provision their burrows with wads of pollen mixed with nectar to nourish their larvae. You can observe receptive females peering from their burrows. If you keep watching, you

will observe one or more males clamoring around burrow entrances intent on getting acquainted with a female ... at which point you should look away.





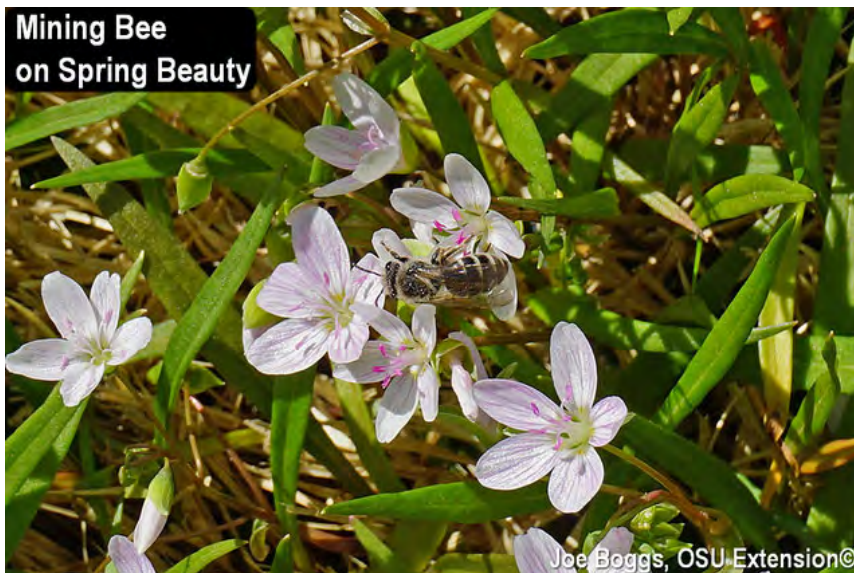
Mated females deposit multiple eggs in their burrows and the resulting larvae feed and develop on the pollen / nectar banquet provided by the females. Winter is spent as pupae in the burrows with adults emerging in the spring to start a new round of bees.

Occasionally, you may find conical-shaped holes dug within the mining bee colonies. The holes are evidence that skunks or raccoons were searching for a bee morsel meal.



Bee Supportive:

Mining bees are important polylectic plant pollinators meaning they gather pollen from many different plants. They are particularly important for pollinating spring-blooming food crops including apples, cherries, and blueberries.



Unfortunately, the low-level flight plans by the males may be frightening to the unenlightened. While the females are busily digging and provisioning their burrows, the pugnacious males cruise menacingly back and forth just above the soil chasing other males or possibly predators. It's all a rouse because the males lack stingers (= ovipositors).

However, the collective buzzing sound made by the males can be intimidating to uninformed gardeners or landscape managers. Indeed, the family name Andrenidae is derived from the Greek *anthrene* which originally referred to any buzzing insect.



Solitary soil burrowing bees, including mining bees, are not aggressive. You almost need to try to get stung to be stung. Even then, stings from these bees don't pack much of a punch; their small stingers can't penetrate far into the skin.

Of course, large numbers of bees buzzing around at knee-height may trigger fear in the uninitiated prompting ill-advised efforts to eliminate these beneficial insects including applications of insecticides. This practice should be strongly discouraged. Instead, cultivation practices aimed at thickening turfgrass will convince the bees to burrow elsewhere.

Fortunately, fear of these highly beneficial insects may be calmed through education. For example, I've taken pictures of signs placed over colonies in Spring Grove Cemetery and Arboretum by Dalton Westerbeck who is an Ohio State Beekeepers Association, Master Beekeeper. The signs are a proactive educational approach to calming fears by explaining to visitors exactly what is happening with these beneficial bees. Included on the sign is a list of plants that will support these helpful pollinators; a sign of good environmental stewardship!



Other Articles

Spice Girl Viburnum Is a Highly Fragrant Shrub

MEGHAN SHINN

APR 7, 2020

- Source: <https://www.hortmag.com/plants/spice-girl-koreanspice-viburnum>

Virtues: Spice Girl Koreanspice viburnum blooms in the early spring, with pretty, rounded flower heads that emit a lovely and strong spicy-sweet fragrance. This deciduous shrub brings another round of interest in the fall, when its leaves turn gorgeous shades of red and purple. This easy, vigorous, large grower can stand alone or grow with companions as a hedge. Just be sure to site it where you'll enjoy its spring scent.



© Proven Winners® ColorChoice®

Common name: Spice Girl Koreanspice viburnum

Botanical name: *Viburnum carlesii* Spice Girl ('Spiro')

Exposure: Full to part sun

Flowers: Round flower heads start out as clusters of bright pink buds in early spring. These open to star-shape pink flowers that fade to white over time. The flowers are strongly fragrant, with a gorgeous sweet scent.

Foliage: The rounded deciduous leaves are a medium matte green from spring through summer. They turn red and purple in the fall.



Habit: Spice Girl viburnum is a deciduous shrub that grows 6 to 7 feet tall and wide.

Origin: The species *Viburnum carlesii* is native to Korea and Japan. Spice Girl ('Spiro') is an introduction from Proven Winners ColorChoice Shrubs.

How to grow it: Plant Spice Girl Koreanspice viburnum in full or part sun and average soil with good drainage. Provide water in times of drought. If pruning is necessary, do so immediately after it flowers. Spice Girl is a female cultivar that will produce berries but only if it is paired with a male *V. carlesii* cultivar in the vicinity, such as Spice Baby. USDA Zones 4–9.

If you're trying to add more fragrant plants to your garden, check out Ken Druse's book [The Scentual Garden](#).

**Prepared by Jeff Stachler
Ohio State University
Agriculture and Natural Resources Extension Educator, Auglaize County**