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Carpenter bees: What's that buzzing around your porch?

(Elizabeth Barnes, barne175@purdue.edu)

Have you noticed large bees buzzing around your woodpile? Or maybe near your porch? There's a good chance you've encountered carpenter bees. Carpenter bees are large, solitary bees that people often notice in the spring when the bees build their nests. Female bees tunnel into wood using their strong mandibles. The entrance holes to these tunnels are typically about ½ inch wide (about the size of your pinky finger) and perfectly round (image 1). Each tunnel is outfitted with several cells that the females will stuff with pollen and lay a single egg in (image 2). Once the eggs hatch, the larval bees feed on the pollen until they are large enough to pupate and emerge as adults.



IMAGE 1: Carpenter bee entrance holes are distinctive because they are perfectly round and about the size of your pinky finger. Photo by David L. Clement, University of Maryland.



IMAGE 2: Carpenter bees section off their tunnels into chambers. Each chamber is filled with pollen and a single egg. Photo by USDA Forest Service, Wood Products Insect Lab.

Carpenter bees only tunnel into dead wood. If you find a perfectly round hole in a living or recently living tree, you may have found evidence of the highly destructive invasive species Asian longhorned beetle. If you think you've found evidence of this beetle, [please report it!](#)



IMAGE 3: Carpenter bees are often confused with bumble bees. You can tell them apart by looking at their abdomens: bumble bees typically have fuzzy abdomens (a) and carpenter bees have black, shiny abdomens (b). Photos by David Cappaert and Ansel Oommen.

How do I know if I've seen a carpenter bee?

Bumble bees are often confused with carpenter bees. The quickest way to tell them apart is to look at their abdomen. Bumble bees typically have fuzzy abdomens (image 3 a) whereas carpenter bees have shiny, black abdomens (image 3 b). If you're still unsure if you've seen a carpenter bee, we suggest trying out the [iNaturalist app or website](#). This project can help you to identify all sorts of organisms and your observation will be added to an international biodiversity project. You can also send a specimen to Purdue's [Plant and Pest Diagnostic lab](#) to be identified for a small fee.

Do they sting?

Seeing several large bees buzzing around your home can seem quite threatening but these bees are mostly harmless. Male bees can seem aggressive but can't sting. Females can sting, but they rarely do so. In most cases, they will only sting if held tightly in your hand or if you directly attack their nest. Male bees can be distinguished from female bees by the yellow square on their face.

How much damage do they cause?

The amount of damage that these bees cause varies widely between locations but, in most cases, the damage is relatively minor. Carpenter bees like to re-use the same tunnels year after year rather than building new ones. Once they've built a tunnel, they are unlikely to expand it further. However, in some cases, they can cause cosmetic or structural issues. The tunnels can also allow moisture to get into the wood and cause further damage. In addition, woodpeckers occasionally enlarge carpenter bees' tunnels to eat the larvae inside.

How can I protect my property?

The best way to protect your property is to discourage the bees from nesting where you don't want them in the first place. Carpenter bees prefer unpainted, soft wood and will generally avoid painted wood, pressure treated wood, and hard woods. Taking preemptive measures like painting wood or using hardwood in construction can discourage the bees from tunneling into areas you don't want them. However, this will not always guarantee protection. We have outlined further treatment methods using a combination of insecticides and filling in the bee's tunnels in our bulletin on [Carpenter Bees](#).

Do they have positive impacts?

Carpenter bees, like many native solitary bees, are excellent and important pollinators. If you have a garden or flowering tree, you might have these bees to thank for some of your harvest!

Additional Resources:

[Carpenter Bees](#)

[Solitary Bees and Wasps: Carpenter Bee, Cicada Killer, and Mud Daubers](#)

Cover image by Jim Baker, North Carolina State University

Tobacco Rattle Virus (TRV)

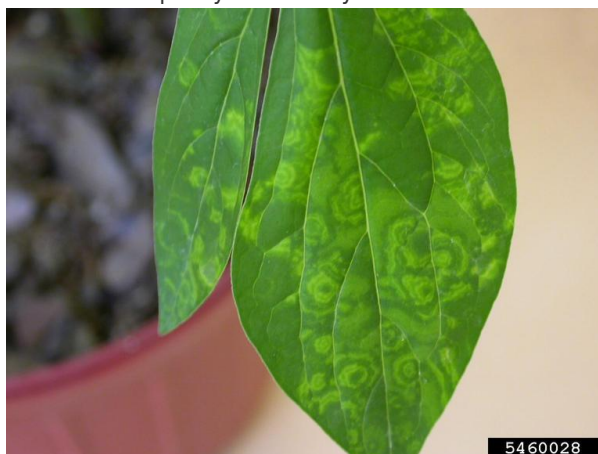
(John Bonkowski, jbonkows@purdue.edu)

Tobacco rattle virus (TRV) is a very important pathogen in the ornamental industry. Don't let the name fool you. Much like

Tomato spotted wilt virus and Alfalfa mosaic virus, TRV has a wide host range that includes more than 400 plant species, and is not restricted to Tobacco or vegetables. Plant viruses are named after the host plant it was originally found to infect and the symptoms they caused, so their names follow this basic formula: "Plant Host" + "Symptoms Caused" + Virus. While "rattle" symptoms are not commonly observed in many plants, the characteristic ringspots, mottling, and chlorotic line patterns that we associate with a plant virus are frequently found in TRV infected ornamentals. Over time, infected plants show reduced vigor and aesthetics, but highly susceptible plants can show dieback symptoms.



Leaves from a peony infected by TRV. Photo Credit: PPDL



Ringspot and mottle symptoms in peony caused by TRV. Photo Credit: Anette Phibbs, Wisconsin Department of Agriculture, Bugwood.org



Chlorotic Line pattern in peony associated with TRV infection

Photo Credit: John Fisher, Ohio Department of Agriculture,
Bugwood.org

TRV can be transmitted by nematodes, sap transmission, and grafting. Stubby root nematodes, *Trichodorus* and *Paratrichodorus* species, can transfer the virus from infected hosts to non-infected hosts. This is especially problematic in farm fields or field grown nurseries where infection can occur year after year due to the presence of a nematode population in the soil. The virus can also be transmitted when sap from an infected plant and comes into contact with another plant. Propagation, pruning, and simple leaf injury can lead to the transmission of a virus by infested tools. Grafting, similar to propagation, will place infected tissue in contact with a healthy plant and allow virus transmission.



Chlorotic pattern developing along leaf vein of TRV positive hosta.
Photo Credit: PPDL



Chlorotic mottling and chlorotic and necrotic ringspots associated with TRV in infected hosta. Photo Credit: Alan Windham, University of Tennessee, Bugwood.org

Any plant infected with a virus cannot be cured by use of pesticides. In most cases removal of symptomatic tissue may make it appear that the rest of the plant is healthy, but the virus is still present throughout the rest of the plant. Removal of infected plants is important to reduce the potential for spread of

the virus to other nearby hosts. Disinfect tools if they come into contact with an infected plant using hot soapy water and washing your hands thoroughly. Professionals may use commercially available disinfectants, such as peroxide products, after cleaning tools of soil and organic material. Management of the vector is not very practical in landscape and home garden situations and is not recommended. Be sure new plants are healthy before installation and have them tested if they show virus symptoms.



Viral symptoms caused by TRV in Epimedium. Photo Credit: Anette Phibbs, Wisconsin Department of Agriculture, Bugwood.org



Chlorotic ringspots and line pattern in TRV infected bleeding heart. Photo Credit: John Fisher, Ohio Department of Agriculture, Bugwood.org

Why is Professional Soil Testing So Essential??? – PART 2

(Chris Carlson, Associate Professor, Kent State University, crcarlso@kent.edu)

PART 2 - The Importance of Chemical Soil Testing

To determine soil fertility, soil acidity (pH), and organic matter percentages, it is absolutely essential to test your soil. A soil test will tell you how much, if any, organic matter, lime, sulfur, and or fertilizer your soil needs. Determining whether or not your soil needs certain nutrient fertilizers, organic matter, lime or sulfur applications requires proper soil sampling at the proper root depth prior to planting your plants. Take enough random soil samples down to the average root depth of your crop and sample the entire area uniformly. For grass, samples are usually taken at a 3" depth. For trees and shrubs, soil samples are usually taken at a 6-8" depth but with good drainage, roots may penetrate even deeper so it's smart to see if you have roots in the soil cores. Do NOT take soil samples after you have applied fertilizer or your lab results will be skewed. Soil should be tested before applying fertilizers, lime, sulfur, etc.



Figure 1: Sample several locations for a more accurate analysis in your landscape and lawn.

Many state labs will recommend you to take 10-12 uniform soil core samples per 8,000 square feet of the area sampled. A minimum of one cup of dry soil is recommended by many labs but some recommend 2 cups of soil to be sent in. Remember to scrape off the top mulch, grass/thatch, and debris before you take the soil samples and drop them into a clean plastic bucket so it doesn't contaminate the soil. For proper soil sampling, see **"Collecting Soil Samples For Testing", Bulletin # HO-71-W** from the Purdue Extension Publications. Once you've collected the uniform soil samples and mixed them together, crushed them to the size of wheat grains and dried them (without heat), take the soil samples to your County Extension office, which can then send them to a professional soil testing lab. Be sure to write down the "primary" crop you're wanting to grow. Once the lab tests the soil, the written soil test report will tell you what deficiencies and toxicities you have and what you need to apply and how much you should apply prior to planting, whether it's long-lived trees, shrubs, lawns, perennial flowers or vegetable gardens. So when are fertilizer, lime, and organic matter applications the most beneficial? **When you have severe deficiencies.** When nutrient levels are deficient or excessive, the crop suffers. Be sure your soils lab specializes in your particular crops because some labs only specialize in agronomic crops and not ornamentals. The power of doing soil tests every 2-3 years is huge so you're maximizing yield and beauty and not wasting time and money and not polluting our streams, rivers, lakes, and ground water from excessive applications.

A routine soil test will usually provide you with four critical pieces of information including: soil pH (acidity), percent organic matter, and an estimate of plant-available phosphorous and potassium. Acidic plants need lower pH which is why annual applications of lime can raise the pH so high, the plants may die from micronutrient deficiencies. Do NOT add lime unless a soil test recommends it for your main crop. If you also have magnesium deficiencies, dolomitic lime (containing magnesium) should be used. People that add lime every year typically have an

excessively high soil pH which can reduce the availability of phosphorous, iron, manganese, zinc, and boron. I've seen acid requiring tree's roots growing out into lawns that were limed way too often and have foliar micronutrient deficiencies. A leaf nutrient tissue test will confirm nutrient deficiencies and also help determine the need, formulation, and rate of fertilizer needed.



Figure 2: Nutrient deficiencies can occur within individual trees in the same planting area.



Figure 3: Chlorosis is an indicator of many deficiencies and tissue analysis may be necessary to get the true determination.

The amount of organic matter you have in your soil is very important because the more organic matter you have in your soil, the better the water holding capacity, drainage and tilth you have. If your organic matter is less than 2-3% by weight, adding more organic matter in the form of compost, peat moss, aged manure, mulch, organic fertilizers, etc. is highly recommended. If you have more than 8% organic matter, you don't need to add anymore for a while. Phosphorous, (P) is essential as well and stimulates root development, rapid growth, and quality flowers. If your phosphorous levels are low, < 30-50 pounds/acre, adding phosphorous and working it down into the soil is highly recommended. Phosphorous doesn't leach downward readily like nitrogen and potassium do, so incorporating it down into the root zone BEFORE you plant is highly encouraged. Core aerating the

soil and then applying recommended phosphorous helps it get down to the roots. For many plants, the ideal range for phosphorous is 50 to 100 pounds per acre with the midpoint (75#/ac) being ideal. Potassium (K) is also essential to your plants and promotes winter hardiness, strong stems, disease resistance and lessens drought stress. If your potassium levels are low, <200 pounds per acre, adding potassium will be highly recommended. For a majority of plants, ideal potassium ranges from 200-400 pounds per acre with the midpoint (300#/ac) being ideal. For routine soil testing, nitrogen is not normally tested by soil labs due to its rapid loss and variability. Nitrogen can be applied periodically for many crops but excess, quick-release nitrogen can stimulate too much vegetative growth, delay fruit production of garden vegetables and flowers and it can also create highly lignified thatch problems in lawns. This is why slow-release, Spring fertilizers like sulfur coated urea, urea formaldehyde, or organic fertilizers like Milorganite are highly recommended because they can prevent the excess surge growth and release the nitrogen throughout the season. If you're going to be fertilizing your lawn in the Spring, do NOT use quick release fertilizers but choose fertilizers that have a high percentage of water-insoluble, slow release fertilizer. Slow-release fertilizers cost more but don't pollute our environment and release their nitrogen slowly throughout the season so you don't have to apply nitrogen every 2-4 weeks.

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Remember, use only the amount of fertilizer or compost that is recommended because more is NOT better. The only time fertilization is going to be the most helpful and economically profitable and aesthetically warranted, is when you know you have severe deficiencies for your particular crop. **DON'T GUESS - SOIL TEST!!!!**

For more information, check out these great Purdue Extension Publications:

“Collecting Soil Samples for Testing” (HO-71-W)

“Cover Crops in the Home Garden” (HO-324)

“Home Gardener’s Guide” (HO-32-W)

“Indiana Vegetable Planting Calendar” (HO-186-W)

“Fertilizing Woody Plants” (HO-140-W)

Our Nation’s Best Soils Website!

- nrcs.usda.gov
- <http://websoilsurvey.nrcs.usda.gov/app/> **Excellent Soils Info on Your Site!**

To visit Part 1 of this series –

<https://www.purduelandscapereport.org/article/why-is-professional-soil-testing-so-essential-part-1/>

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