What's Growing On?

BASTROP COUNTY MASTER GARDENER ASSOCIATION

December 2021

Carpenter Ants

By Wizzie Brown

With the freeze we had earlier this year, many people lost trees or branches of trees. While this led to trees being cut down or pruned by many, not everyone chose to get rid of the dead trees or limbs. If you, or your neighbor, is one of the people who choose to leave things in place, you may now be dealing with carpenter ants.

Carpenter ants are large ants varying in color from all black to reddish to yellowish or a combination of these colors. They have one node, no stinger, and a circle of hairs at the tip of their abdomen (which you'll need a good hand lens or microscope to see). They also have a smoothly humped thorax when you look at them in profile.

Carpenter ants typically nest outdoors in dead wood (tree stumps, dead limbs, fences, firewood, etc.). They sometimes can be found in wood siding, beams, joists, fascia boards, or trim on structures. Damage is usually limited since carpenter ants tunnel and nest within wood; *they do not eat wood*. However, wood can become weakened by carpenter ant excavation.

Galleries in carpenter ant nests are excavated following the grain of the wood and have clean, smooth walls which allows you tell the difference between carpenter ant damage and termite damage. Nest locations can sometimes be discovered by searching for piles of sawdust-looking material under kick-out or exit holes; this is the carpenter ant frass or waste material. Frass is made up of

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2022 Bastrop County Master Gardener Class

When: Feb. 5, 2022 - May 14, 2022
Saturdays, 9am - 1pm
Where: In-person classes in Bastrop
Cost: $185 (before Dec 1st)
$200 (after Dec 1st)
Registration is limited, sign up early
Download an application at txmg.org/bastropcounty or pick one up at:
Bastrop Agrilife Extension
901 Pecan St in Bastrop
Email class@bcmga78602.org for more info

Learn about:
- Vegetables and herbs
- Flowers and trees
- Plant propagation
- Rainwater/irrigation systems
- Landscape design
- Pollinator gardens
- And more!

The Bastrop County Master Gardener Association, a 501 (c)3 nonprofit organization, is a program of Texas A&M Agrilife Extension

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[Note: $185 price good through December 31, 2021.]

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coarse pieces of wood and may also contain soil or sand, uneaten insects, as well as dead ants from the colony.

Carpenter ants have mating flights, or swarms, to begin new colonies. After mating, males die while females drop to the ground, chew off their wings, and locate a suitable nesting site. Females then lay 15-20 eggs which develop into worker ants in about two months. The queen cares for the first batch of brood (eggs, larvae, pupae) and feeds them secretions from her body. Once the first batch of brood has emerged as adult workers, they take over care of the colony by expanding the nest, providing food for the queen, and caring for new brood.

When carpenter ants are found outdoors, they do not really cause much of an issue, but they are able to enter homes from tree branches or utility lines touching the home, through cracks and crevices around windows and doors, cracks in foundation walls, ventilation openings, or heating and air conditioning ducts.

Here are some tips for a carpenter ant infestation:

- Remove dead trees, limbs, and tree stumps from the landscape. You can remove the (possible) nesting sites and get rid of the ants without using pesticides.
- Prune trees and shrubs that touch or overhang the home. Carpenter ants can use these areas as a bridge to enter homes.
- Replace wood that has water, fungal, or termite damage. Carpenter ants prefer wood that has damage from previous issues.
- Remove wood debris and firewood that is near the home. Carpenter ants may nest in firewood and when it is stacked right next to the home, it allows ants to enter easily.

For more information or help with identification, contact Wizzie Brown, Texas AgriLife Extension Service Program Specialist at 512.854.9600.

New Website Features

Check out our website, which features project slideshows, a new photo gallery section, and an events calendar to check out upcoming activities. Find news articles and our newsletters. Thanks to Dave Posh for keeping the info timely for us https://txmg.org/bastropcounty/

Volunteering

Master Gardeners volunteer in the community to teach others about horticulture. We follow the research-based recommendations of Texas A&M AgriLife Extension. Members who complete 50 hours of volunteer service in the year after training earn the designation “Texas Master Gardener.” We use our title only when engaged in Texas A&M AgriLife Extension activities.

The Benefits of Soil Testing

By Howard Nemerov

> *"Wherever you live and garden, improving your soil is critical to gardening success…It is a good idea to have your soil tested every few years…That way you can be sure to apply the right amounts of the nutrients that are most needed and avoid adding nutrients already present at high levels."* —Robert "Skip" Richter, Texas A&M AgriLife Extension Horticulture Agent, Brazos County[1]

Feed the soil, and the soil feeds your plants. The healthier the soil, the healthier your plants. Soil testing empowers you to fine-tune your amendment program to attain healthy soil sooner and with less effort.

Preparing your soil test submission

AgriLife Soil Testing provides directions in their soil sample form on page 2.[2] They recommend collecting at least 10 small samples from your beds. I mix them all together in a five-gallon bucket, fill up a 1-quart bag, and mail.

Their $19 analysis suite includes pH, and primary and extended micro-nutrient results. This is my annual test. You can pay for more detailed analysis, if you believe it would help get you started on a better soil care program. AgriLife explains what's included in each extended analysis: examples include detailed salinity and boron.

Understanding test results

Figure 1 shows soil test results for my vegetable beds. After years of layering fall leaves, rabbit manure, and wood chips, microbial activity has reproduced the forest floor environment, setting up a cycle of decomposing organic matter near the soil that provides balanced, slow-release fertilizer, eliminating tilling and the need for regular fertilizing.[3] On the report, "CL" means "critical level," the threshold at which there's no need to immediately amend the soil. This should coincide with "Fertilizer Recommended" in the right column. Note that sodium levels are low, but that's a feature, as discussed below.

Customer Sample ID: Veggie Beds
Crop Grown: GARDEN

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	7.0	(6.5)	-	Slightly Acid	
Conductivity	579	(-)	umho/cm	Slight CL*	
Nitrate-N	134	(-)	ppm**		0 lbs N/1000sqft
Phosphorus	1,712	(50)	ppm		0 lbs P2O5/1000sqft
Potassium	552	(175)	ppm		0 lbs K20/1000sqft
Calcium	7,497	(180)	ppm		0 lbs Ca/1000sqft
Magnesium	673	(50)	ppm		0 lbs Mg/1000sqft
Sulfur	77	(13)	ppm		0 lbs S/1000sqft
Sodium	69	(-)	ppm		
Iron	7.05	(4.25)	ppm		
Zinc	46.04	(0.27)	ppm		
Manganese	25.23	(1.00)	ppm		
Copper	7.52	(0.16)	ppm		
Boron					
Limestone Requirement					0.00 lbs/1000sqft

Figure 1: Soil test results

Nitrogen: Apply an additional 1 lb N/1000 sqft every 4-6 weeks, as needed, to maintain vegetative growth.

Phosphorus: Phosphorus is highly elevated, avoid phosphorus containing fertilizers and organics for the next 5 years, retest annually.

Figure 2: Soil test recommendations

This takes us to the notes below the chart, where it says to apply one pound of nitrogen (N) per 1,000 square feet of bed space "every 4-6 weeks, as needed, to maintain vegetative growth" (Figure 2). This is because even with high nitrogen levels, you'll need to add more to replace what plants consume during normal growth.

There can be too much of a good thing. My soil has elevated phosphorus levels, even though I don't add phosphorus (P) fertilizer. Rabbit manure and fall leaves contain low levels of phosphorus. It's possible

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that regular mulching contributed to high-P levels, or it could be endemic to my soil. In any case, getting your own soil test will tell if you also have high-P levels. This condition may result in poor plant health:

> *"Excessive soil phosphorus reduces the plant's ability to take up required micronutrients, particularly iron and zinc, even when soil tests show there are adequate amounts of those nutrients in the soil."* [4]

High soil phosphorus pollutes waterways when washed away by rain.[5] High-P levels in water speeds up the process of eutrophication, a reduction in dissolved oxygen.[6] Eutrophication causes algae blooms, dead zones, and fish kills.[7]

Higher-P levels is not necessarily all bad: Organic, water-soluble P amendments are expensive and hard to find, and I like organically-grown vegetables. But as the soil test notes: high-P levels require annual testing to monitor it. In my case, phosphorus levels have declined since I began annual testing in 2018. While still high, the downward trend indicates improved soil management.

Soil pH

The U.S. Geological Survey defines pH as:

> *pH is a measure of how acidic/basic water is. The range goes from 0 to 14, with 7 being neutral. pHs of less than 7 indicate acidity, whereas a pH of greater than 7 indicates a base. pH is really a measure of the relative amount of free hydrogen and hydroxyl ions in the water. Water that has more free hydrogen ions is acidic, whereas water that has more free hydroxyl ions is basic.* [8]

Too acid or too alkaline renders nutrients unavailable to plants. A lab test may show your soil has nutrients, but they must be bioavailable to plants. As PennState Extension notes: "Usually when we see a micronutrient deficiency in a plant, it is not because there is not enough of the nutrient in the soil, it is because the soil pH has limited the availability of that nutrient." [9]

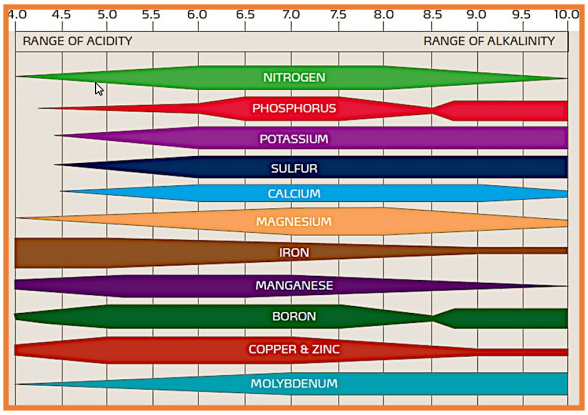

Figure 3: Influence of soil pH on nutrient availability.

The nutrient availability graph to the left shows how some essential elements—like iron and zinc—become less available as pH becomes alkaline (pH over 7.0). Other elements—like phosphorus and magnesium—become less available as pH becomes more acidic (pH less than 7.0).[10] Slightly acidic soil offers optimal uptake over the range of essential minerals, pH at or just below 7.0. If your soil tests too acidic or alkaline, AgriLife Soil Testing will include recommendations in your results.

Salinity

AgriLife Soil Testing provides a "conductivity" number with their test results. While not as precise a salinity indicator as results provided in their Detailed Salinity test, it "provides a good idea of overall changes in soil salinity with time." Salinity levels are important to track because, "as the soluble salts increase, the ability of the plant to continue to take up water diminishes." [11]

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A few years ago, my conductivity levels were elevated, and AgriLife recommended that I "remove salts with 10–15 inches of clean leach water." Local water is hard, so spending that much money on municipal water would have done little. Conductivity levels can rise and fall with rainfall patterns: less rain corresponds with higher soil salinity; wetter periods reduce salinity. If conductivity remains high after a wetter period, you might have a problem.

Adding nutrients via fertigation

I like to apply water-soluble nutrients when irrigating, a process called fertigation. Sodium nitrate is an organic, water-soluble nitrogen source.[12] (Note: If you're using dry fertilizers, the calculation process below remains the same.)

My soil test recommended adding one pound of nitrogen per 1,000 square feet monthly. I break it into two biweekly applications, providing smaller dose more often to reduce peaks and valleys in nutrient availability. Here's where a spreadsheet comes in handy. If you haven't yet gotten in touch with your inner nerd, AgriLife offers an online calculator.[13] I'm explaining it for those who want to understand how to "do it yourself." [See Figures 4 and 5 to follow calculations and formulae.]

	A	B	C
1			Bi-we
2	Allganic Nitrate Plus		
3	*Lb for me*	*1 Lb/1,000 sq ft*	
4	453.59	Gram/Gal	
5	*Grams*		
6	151	Per 16 Gal	
7	302	Per 32 Gal	
8	453	Per 48 Gal	
9	604	Per 64 Gal	
10	755	Per 80 Gal	
11			
12	15.00%	% N	
13	0.15	N/Lb	
14	0.05	Pounds/100 sq ft	
15	0.33	Lb. Allganic/100 sq ft	
16	Assumes 16 gal Stock/100 sq ft		

Figure 4: Fertilizer calculator

First of all, that means I need to apply half a pound of nitrogen to fertilize 1,000 square feet biweekly (1 pound divided by 2 applications) to help vegetables reach optimum productivity. I divide by 10 again, since I don't have 1,000 feet of bed space and want to calculate in units of 100 square feet, leaving me with 0.05 pounds of nitrogen per 100 feet (0.5 times 100 feet divided by 1,000 feet).

The fertilizer I use has an analysis of 15-0-2 (N-P-K), with "15" meaning that 100 pounds of fertilizer contains 15 pounds of nitrogen, or 15% nitrogen by weight. If you wanted to apply one pound of nitrogen, you need 6.67 pounds of sodium nitrate (1 divided by 15%). (Note: A little potassium isn't going to hurt, since it's required in many plant processes and gets consumed as a result.)

	A	B
1		
2	Allganic Nitrate Plus	
3	*Lb for me*	*1 Lb/1,000 sq ft*
4	453.5924	Gram/Gal
5	*Grams*	
6	=ROUND(A15*A4,0)	Per 16 Gal
7	=A$6*2	Per 32 Gal
8	=A$6*3	Per 48 Gal
9	=A$6*4	Per 64 Gal
10	=A$6*5	Per 80 Gal
11		
12	0.15	% N
13	=A12*1	N/Lb
14	0.05	Pounds/100 sq ft
15	=A14/A12	Lb. Allganic/100 sq ft
16	Assumes 16 gal Stock/100 sq ft	

Figure 5: Fertilizer calculator formulae

Here's where a calculator or spreadsheet is handy. For every 100 square feet, I need to apply 0.33 pounds of sodium nitrate (0.05 divided by 15% or 0.15). This way, I can calculate how much fertilizer I need for larger areas, depending on how much is in production. For example, I need 1 pound of sodium nitrate to fertilize 300 feet of vegetable beds every two weeks (0.05 pounds of N divided by 15% times 3), mixed in warm water until completely dissolved.

Using a siphon mixer allows me to water crops while also providing nutrients. (I use the mixer below.) Each siphon mixer has its features and faults, so I won't recommend one. An internet search will show you what's available. Most mix at a rate of 16:1, meaning one gallon of stock solution gets taken up for each 16 gallons of water passing through the siphon, or 1 gallon of stock solution produces 16 gallons of nutrient solution applied to soil. To fertilize 300 feet of bed space, I usually dissolve that pound of sodi-

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um nitrate into 2–3 gallons of water in a 5-gallon bucket, then apply through the siphon mixer until stock solution is gone.

Sodium nitrate is a salt, making it readily available to plants.[14] Remember that nutrients must be in salt form to be taken up by plants. Salts dissolve in water; this watery solution is then drawn in by plant roots and carried into the leaves by transpiration.[15] This is another benefit of fertigating with amendments like sodium nitrate.

When it comes to gardening, we make our own luck. The best way to do this is to research, plan, record, analyze, compare to original plan, and start again at research. Regular soil testing is an invaluable tool to help you become a more successful gardener.

Endnotes

[1] Richter, Robert "Skip", *Month-by-Month Gardening: Texas* (Cool Springs Press, 2014), page 8.
[2] "Soil Sample Information Form." Texas A&M AgriLife Extension. Accessed December 6, 2021. https://soiltesting.tamu.edu/files/websoilunified2021.pdf
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[13] "Soil, Water and Forage Testing Laboratory Urban Fertilizer Management Calculator-Basic Edition 1.0." Texas A&M AgriLife Extension. Accessed December 1, 2021. https://soiltesting.tamu.edu/calc/UNCalc.htm
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[15] Streich, Anne M. et al. "Plant Nutrients and Soil Fertility." University of Nebraska Extension, page 4. Accessed December 6, 2021. https://extensionpublications.unl.edu/assets/pdf/ec1275.pdf