

Continued from previous page

live with my husband Brad, who is in his 2nd year at the OSU vet school, and my two cats, Apollo and Lulu. I have an obvious interest in bats due to my degree; however my general interest is in woodland wildlife. I have had some great jobs working in the research arena, but this past year, I worked as a naturalist for the Columbus and Franklin County Metro Parks. Through that experience, I developed a passion for environmental education that led me on a path to my current position. I am very excited about this opportunity and look forward to being a part of the Ohio Woodland Stewards Program!

Ohio Maple Days

This year's Ohio Maple Days Workshops are scheduled for:

January 17 Morrow County
Lutheran Memorial Camp, Fulton, OH

Check Us Out On The Web!
Look for newsletter articles, links to fact sheets and other publications by browsing our site. Registration for upcoming Woodland Stewards classes may also be done electronically. Go to:
<http://woodlandstewards.osu.edu>
Kathy L. Smith
Extension Associate, Forestry
Ohio Woodland Stewards Program Coordinator

Contact Us!
For program information contact Mary Slyby at 614-688-3421 by email:
ohiowoods@osu.edu
or by mail at:
Ohio Woodland Stewards Program
School of Environment & Natural Resources
210 Kottman Hall
2021 Coffey Road
Columbus, OH 43210

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TDD No. 800-589-8292 (Ohio only) or 614-292-1868

January 26 Wayne/Holmes County
Mennonite Christian Assembly Church,
Fredericksburg, OH

January 27 Lake County
Lake County Metroparks Farm Park, Kirtland, OH

This year's program guest is Dr. Tim Perkins. Dr. Perkins is the Director of Proctor Maple Research Center in Underhill, Vermont and will present information on '*Maximizing Syrup Yields Tips & Tricks*', '*Maple Research & Results from Proctor*' and '*Air Injection: What Research Reveals*'.

Registration is \$30 per person and is due by January 4, 2008. For more information contact Gary Graham at 330-263-3799.

Calendar of Classes

January

- 24** Your Woods and EAB, Marysville, OH
- 26** North Central Ohio Wildlife Conference, Huron, OH
- 26** Ohio Christmas Tree Assn, Winter Meeting Columbus, OH



An Ohio Woodland Stewards Program Publication Vol. 7, No. 1

Winter 2008

Forest Health Cankers and Galls: What Are They?

Joe Boggs, OSU Extension Educator Horticulture



Nectria canker on sassafras

You see an abnormal looking area on the bark of a twig. Is it a gall? Is it a canker? Or, is it something else? The terms "gall" and "canker" are sometimes mistakenly used interchangeably. The mistake is understandable because some cankers mimic galls, and some galls mimic cankers. Adding to the confusion, definitions in the literature may fail to clearly distinguish the two terms.

Cankers and galls are actually very different, and it is important to know the differences; not only for a correct diagnosis, but also for developing an appropriate response. This is the first in a series of articles that will closely examine cankers and galls. We will start with defining the two terms. Then we will delve into the examining the causes of cankers and galls.

What is a Plant Canker?

“A sunken, necrotic lesion of woody root, stem or branch arising from the disintegration of tissues outside the xylem cylinder, but sometimes limited in extent by host reactions which can result in more or less massive overgrowth of surrounding tissues” (Holliday, P. (1989), *A Dictionary of Plant Pathology*. Cambridge University Press, Cambridge)



Botryospheria canker on ash

There are several important points in this definition:

1. Plant cankers occur on stems and roots. They do not appear on leaves, or other parts of the plants.
2. The term "canker" refers to a symptom, not a cause. Thus, a canker could be caused by a number of things including: mechanical or physical injury; chemical injury; physiological problems; insect pest activity, and plant pathogen activity (e.g. fungi, bacteria, etc.).
3. A canker means there is death of plant cells (necrosis). The cell death may stimulate a plant response (e.g. "overgrowth"); however, the first symptom is necrosis.

What is a Plant Gall?

“Plant **galls** are "abnormal" structures that develop in the cells, tissues, or organs of a plant ONLY when it is colonized by certain parasitic organisms such as bacteria, fungi, nematodes, mites, or insects.” (John Meyer, NC State Univ., Ent. 525, "Entomology for Educators”).

This definition very accurately describes the complete gall story. The "abnormal" plant structure only occurs when the plant tissue is colonized by a living parasitic organism, the "gall-maker."

The intimate connection between a plant gall and a gall-maker is one of the most intriguing and unique stories in biology. The galls are composed of plant tissue; however, they are induced and their growth is directed through a continual interaction with a living gall-maker. In the case of insect and mite galls, gall-makers may actually produce plant hormones, or hormone analogs! The gall-maker uses these chemicals to turn plant genes on-and-off causing the plant to grow the gall.

Here are the steps in the rise and fall of insect and mite galls:

1. The female gall-maker initiates gall formation by injecting chemicals while laying eggs.

The Ohio Woodlands, Water, and Wildlife Newsletter is published in part with funding from the Renewable Resource Extensions Act (RREA).

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- 2. The eggs exude chemicals that continue directing gall-formation.
- 3. The immature gall-maker (larvae or nymphs) exude chemicals that continue directing gall-formation, and stimulate the plant to support the gall tissue.
- 4. Once the gall-maker completes its development, and adults begin to emerge, the galls are said to be "mature." The plant discontinues supporting the gall tissue, and the galls begin to decay. Some types of spent galls drop from the plant while others remain attached.

Here are a few "gall laws:"

- 1. Galls are very distinctive:
 - a. They are specific to both the gall-maker and to the host.
 - b. The gall-maker can be identified to species just by examining the gall structure, without the need to actually see the gall-maker.
- 2. Galls form from growing (differentiating) plant tissue they do not form from plant tissue that has ceased growing. For example, leaf galls cannot form once the leaves are fully expanded.
- 3. Galls cannot be prevented once formed!!
- 4. Very few plant galls harm the health of their plant host.

In his pivotal 1917 USDA publication, "Key to American Insect Galls," Ephraim Porter Felt best expressed the wonder of galls when he wrote: "Insect galls are obvious and frequently excite surprise because of the strange form or the wonderful coloring and delicacy of structure."

If not viewed with a sense of wonder and fascination, at least insect and mite gall-makers should garner begrudging respect. So far, no human has managed to duplicate work so handily done be a group of organisms that are often viewed with disdain. Imagine the plant secrets that would be unlocked if we could?



What is the difference between a gall and a canker?

A canker means death of plant cells; a plant gall means growth of plant cells.

Next issue we will explore some specific galls and cankers.

Brrr....How Do They Keep Warm?

Marne Titchenell, Extension Wildlife Program Specialist

As we sit bundled up in our sweaters drinking hot chocolate and watching the snow fall from the comfort of our heated living rooms, one may wonder how all the animals outside are surviving the harsh weather. No, they do not don their own cozy sweaters and turn up the heat in their tree cavities or brush piles, but they do have special adaptations that keep them warm and alive during those cold winter months.

Winter is a challenging time for Ohio's wildlife. The days are shorter and the nights are longer. There is snow covering the ground hiding away sources of food. Finally, the temperature can get below freezing and cold winds can steal away body heat very quickly. So how do animals stay warm enough to survive these harsh conditions?

For all the 'warm-blooded' critters out there, it is vital to keep warm in order to maintain their bodies at a constant temperature. If they cannot do this, they will die. Birds and mammals fall into this category. Birds employ multiple strategies to keep warm such as fluffing their feathers, huddling together, and shivering. A very successful way to cope with winter is simply to go to a warmer place, which is what many bird species are doing when they migrate.

Mammals, while they don't have feathers to keep them warm, have fur that usually becomes thicker in the months approaching winter. Just like feathers on a bird, fur insulates the body by trapping air that is warmed by the animal's body heat. Smaller animals such as mice and voles can remain active the entire winter looking for food in a network of tunnels under the snow. Air becomes trapped between snowflakes, and is warmed by animals creating an 'igloo-like' environment. Those mammals that do not remain active may hibernate, in which breathing, heartbeat, and body temperature is lowered to conserve energy. Examples of animals that hibernate are groundhogs and many species of bats.

For those critters that are cold-blooded, meaning their body temperature changes with that of their surroundings, remaining active during winter isn't likely.



Snakes, lizards, frogs, toads, and salamanders will slow down their body processes almost to a stop during winter. This strategy is known as diapause. When these animals are in diapause, they use a small amount of stored energy in the form of body fat to keep themselves barely alive until temperatures rise. These critters 'sleep' the winter away in logs, rock piles, compost heaps, and any other place where they are safe from predators.

Ever wonder why you can see flies buzzing around on a warm January day, and then as soon as the temperature falls the next day, the flies disappear? That is because many insects overwinter in a dormant state called quiescence. They will remain inactive until the temperature in their microhabitat (i.e. a log) warms enough to support physiological processes. A warm day in January could 'waken' insects only for them to become dormant again when temperatures cool.

Want to help animals out during the winter? It's easy to create winter homes for wildlife. A pile of logs is ideal for mice and voles. Frogs, toads, and salamanders will appreciate a pile of rocks or stones. Provide an easy food source to overwinter birds by putting out some feeders. The animals will thank you for making their winter a little more comfortable!

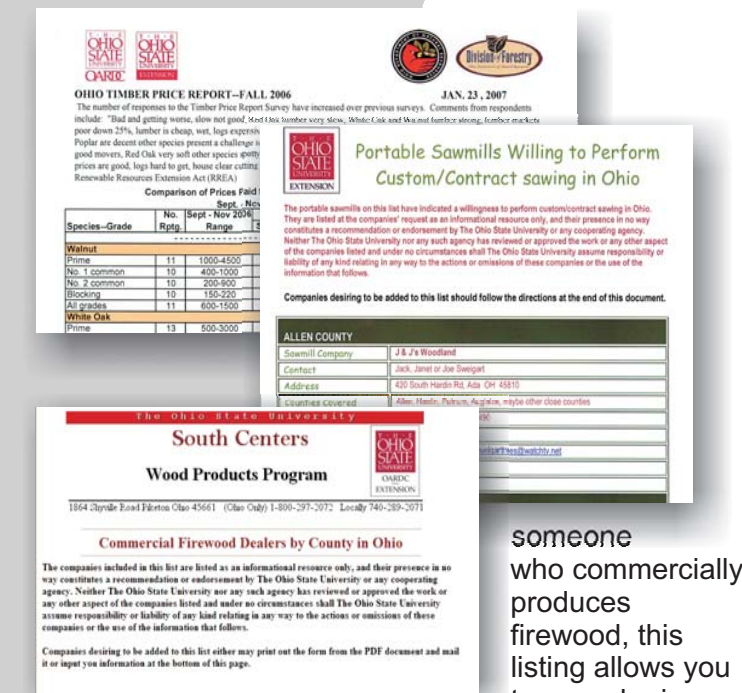
Online Resources

The Ohio Woodland Stewards website has a variety of online resources for woodland owners. Here are a few of them.

Ohio Timber Price Report. This price report is based on responses to a survey that is mailed twice a year to mills around Ohio. Reports are posted in January and July. This report can be accessed from the front page of Woodland Stewards <http://woodlandstewards.osu.edu>

Portable Sawmills A listing of portable sawmills willing to perform custom or contract sawing around Ohio. This list is a voluntary list that we have compiled from a variety of sources. If you are looking for someone in your area, the vendors are listed according to their home county. If you know of someone who would be interested in being a part of this list, there is a form at the end of the document that can be filled out and returned to us. We update this list periodically throughout the year.

Commercial Firewood Dealers a listing of Ohio's commercial firewood producers. If you are in search of



your location. To access this online directory go to <http://southcenters.osu.edu/forestry/harvesting/firewood.htm>

Meet Marne!

Greetings! My name is Marne Titchenell and I am the new Extension Program Specialist in Wildlife. I come from a wildlife and forestry background that I gained right here at The Ohio State University. I first attended the university as an undergraduate in 1999 and in 2004, returned as a graduate student. In 2007 I earned an M.S. in natural resources for my research on the effects of shelterwood harvests on bat populations in oak-hickory forests of southern Ohio. I grew up in Toledo, Ohio so I am an Ohio native; however, I have been fortunate enough to have had the opportunity to live for brief times in different places around the country. For a summer, I lived in northwestern Colorado working for the US Fish and Wildlife Service as a biological technician in Browns Park National Wildlife Refuge. I also lived for a summer in Oscoda, Michigan working for the USDA Forest Service in the Huron-Manistee National Forest as a wildlife technician. Currently, I call Columbus, Ohio my home. Go Bucks! I

