



An Ohio Woodland Stewards Program Publication

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A Promising Bioherbicide for *Ailanthus* May Be Lurking in Ohio Woods

Joanne Rebbeck, Ph.D., Plant Physiologist, USDA Forest Service

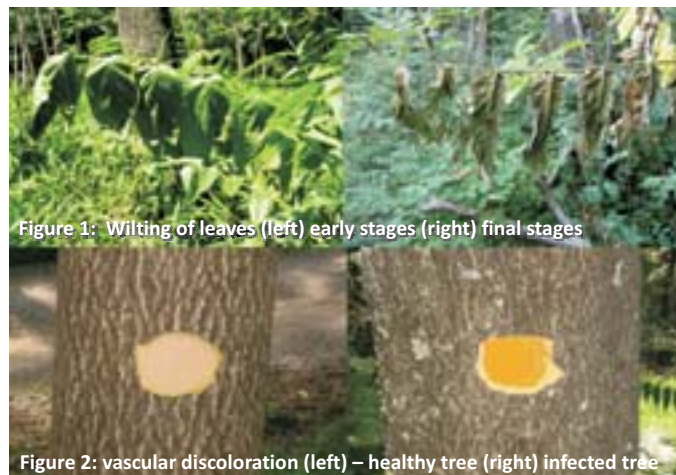
Ailanthus altissima, commonly known as tree-of-heaven, but more appropriately called Stink Tree, due to the pungent odor of its crushed foliage, is an introduced invasive tree found throughout much of the United States. Since it is a rapidly growing and prolific tree, it often displaces native plants and disrupts forested ecosystems. As most woodland owners know, this tree is very challenging to control by cultural and chemical means since it is a prolific sprouter.

In 2002 Penn State forest pathologist Don Davis and his graduate students identified a *Verticillium* wilt that may prove to be an effective biological control agent for *Ailanthus*. The group isolated the

erratic and irregular symptoms than *V. albo-atrum*.

After much rigorous testing and numerous trials in PA, *V. albo-atrum* has proven to be very specific and pathogenic to *Ailanthus*. Seedlings and canopy trees of the following tree species: northern red oak, chestnut oak, red maple, sugar maple, white ash and yellow-poplar were inoculated with the pathogen and it did not induce wilt symptoms or mortality. Within forested areas of dead and dying *Ailanthus* trees, no non-*Ailanthus* trees exhibited any wilt symptoms. Ongoing research continues to test other woody species as well as crop plants. The current list of tested non-susceptible species approaches 50. Since this fungus can quickly and specifically kill *Ailanthus* and it can survive in the soil for many years, it has great potential as a biological herbicide.

Ohioans familiar with this wide-spread and tenacious tree are ecstatic of the potential of a highly effective and economical biological control option. However, before testing of the *Verticillium* wilt on *Ailanthus* can occur in Ohio, the fungus must first be identified as naturally-occurring on *Ailanthus* trees. Hence the USFS Northern Research Station's call for assistance! Researcher Joanne Rebbeck is organizing the effort to officially document the presence of the fungus in Ohio and needs your assistance to look for and report any symptoms of rapidly wilting and dying *Ailanthus* trees. Here is an outline of the symptoms to be looking for this summer:



fungus, *Verticillium albo-atrum* from dead and dying *Ailanthus* trees within forested areas of south-central PA. While *Verticillium* wilts occur on numerous plants including crops, weedy plants and landscape trees this particular strain has proven to be very specific to *Ailanthus*. A second more common *Verticillium* wilt, caused by *V. dahlia*, which is typically associated with nursery, orchard and landscape woody plants, can also attack *Ailanthus*. However, it causes much slower, less severe, more

1. **Rapid or sudden wilting foliage** throughout the entire tree showing symptoms followed by defoliation as leaves die (figure 1).

2. Check for signs of **vascular discoloration** by peeling away the bark (figure 2). Infected vascular tissue will be an orange-brown color compared with a white to cream color tissue in healthy vascular tissue.

3. Large distinct areas of declining, dying, and dead trees (figure 3). It is uncommon to find isolated single infected or dead trees. Tree death is rapid.



Figure 3: Dead and dying Ailanthus trees.

Areas increase over time as infection spreads, typically through root-to-root transmission from infected to healthy trees. The fungus can persist in the soil for many years, which is typical of other *Verticillium* species.

If you observe these symptoms, please contact:

Joanne Rebbeck, USFS Northern Research Station, 359 Main Rd, Delaware, OH 43015
Call at 740-368-0054, or email at jrebbeck@fs.fed.us
Photographs and GPS coordinates would be greatly appreciated.

Tick Check!

Kathy Smith
OSU Extension Program Director Forestry

Yes, it is that time of year when a 'tick check' needs to be done on a regular basis. Did you know there are twelve species of ticks known to occur in Ohio? One species can become established in homes and kennels. Three species can carry disease while the remaining species are rarely encountered throughout the state. All ticks are parasites that feed on the blood of animals. Here are some of the more common ticks you should know.

Brown Dog Tick (*Rhipicephalus sanguineus*)

The adult brown dog tick is reddish brown and unfed adults are about 1/8 inch long. After feeding, the female is much larger (~1/2 inch long), bluish gray, and oval shaped. All stages of the brown dog tick have a pair of small eyes.

The brown dog tick is the one tick in Ohio that can complete its life cycle indoors. They survive in warm dry

conditions that occur inside and outside the home. While these ticks do not thrive in our woodland areas, they do occur in the grassy and bushy areas that are adjacent to these areas. Brown dog ticks can transmit Rocky Mountain spotted fever and several other disease organisms to dogs.

Brown Dog Tick
Image: Mat Pound, Bugwood.org
USDA Agricultural Research Service



American dog tick
Image: Gary Alpert,
Bugwood.org Harvard University

American Dog Tick (*Dermacentor variabilis*)

The adult American dog tick is brown with light grey mottling on the upper surface. The unfed adult female is about 3/16 inches long. After feeding, she is much larger (~5/8 inches long), mostly gray, and oval shaped. The male, whether fed or unfed, is ~1/8 inch long.

This tick will be found in overgrown, weedy areas and along the edges of paths and hiking trails. Larvae and nymphs crawl about actively seeking a host to feed on; typically small rodents. After feeding, they drop to the ground where they seek shelter and digest the blood meal before they shed their skin.

The adult American dog tick is most abundant from mid-April to mid July and feeds on a wide variety of medium to large size mammals, such as raccoons, ground hogs, opossum, dogs, and humans. The adult tick waits on grass and weeds for a suitable host to brush against the vegetation. It then clings to the fur or clothing and crawls upward seeking a place to attach and feed. American dog ticks are the primary transmitter of Rocky Mountain spotted fever.

Lone Star Tick (*Amblyomma americanum*)

The unfed adult female is about 1/8 inch long, brown, with a distinctive silvery spot on the upper surface (hence the name 'lone star'). Once fed, the female is almost circular in shape and ~7/16 inch long. The male tick is about 1/8 inch long, brown, with whitish marking along the rear edge.

Lone Star Tick
Image: Susan Ellis, Bugwood.org
USDA APHIS PPQ



Lone star ticks are common in the southern half of Ohio. They crawl to the tip of low growing vegetation in shady areas along roadsides and edges of our woodlands waiting for a likely host to brush past. This species is a minor carrier of Rocky Mountain spotted fever.

Blacklegged Tick (*Ixodes scapularis*)

The larval stage of the blacklegged tick is about the size of a poppy

seed and nearly translucent, which makes it extremely difficult to see. The nymphal stage is translucent to slightly gray or brown. Adult males are ~1/16 inch long; unfed females are larger (~1/8 inch long). Both sexes are a dark chocolate brown color, but the rear half of the adult female is red or orange. When fed, they may appear gray. All stages lack eyes.

Also called 'deer tick' by some people, the blacklegged tick is found in or near woodland areas but is rare in Ohio. While the immature stages feed on small to medium sized mammals, the adults feed on large mammals, most commonly deer (hence the name 'deer tick'). All stages may attach to humans.

The blacklegged tick (*Ixodes scapularis*), is the principal carrier of Lyme disease.

Injury

Tick feeding often results in inflammation, swelling, irritation, and the potential for secondary bacterial infection at the feeding site. When dogs are heavily

infested, excessive blood loss can result in death. If you experience fever or flu-like symptoms following a tick bite, immediately contact your physician.

Rocky Mountain spotted fever is the most commonly tick transmitted disease in Ohio usually transmitted by the American dog tick. Symptoms of Rocky Mountain spotted fever appear 3 to 12 days after tick feeding and typically include sudden high fever, headache, and aching muscles. On the second or third day of the fever, a non-itchy rash may develop on the wrists and ankles. The rash soon spreads to other parts of the body including the torso, palms, and soles. This disease rapidly progresses and can cause death if not treated with the appropriate antibiotics. Most fatalities can be attributed to a delay in seeking medical attention. Early treatment of spotted fever typically results in rapid recovery.

Lyme disease is the most prevalent tick-borne disease of humans in the United States. However, blacklegged ticks are very rare in Ohio, and the Lyme disease bacterium, *Borrelia burgdorferi*, has never been isolated or identified from any animals or ticks in the state. There are cases of Lyme disease occurring in Ohio but usually these can be tracked to having been acquired out-of-state. However, it is possible that infected nymphs are transported on migratory birds, or blacklegged tick populations may be too low to be detected via current surveillance efforts, although many hundreds of animals have been tested in Ohio.

Be alert for a red, ring-like rash developing at the site of a tick bite within 2 to 32 days, because this ring-rash is diagnostic for Lyme disease. Note, however, that ~40% of infected humans do not develop a ring-rash. Fever, head-ache, fatigue, or joint pain also may be symptoms of Lyme disease. Immediate antibiotic therapy for Lyme disease reduces the risk of neurological, arthritic, or cardiac complications developing days to years later.

Tick Checks and Tick Removal

Inspect for ticks periodically (every hour or so if in tick habitat and as soon as you leave their habitat) to remove them before they attach and begin feeding. Ticks can be found crawling on clothing and bare skin before attachment. Be sure to also inspect children and companion animals.

Pay special attention to the head and back of the neck of humans to detect attached ticks.

PROMPTLY REMOVE any ticks. Prompt removal

of an attached tick reduces the chance of infection by Rocky Mountain spotted fever or Lyme disease. Tick attachment of several hours or more often is required for disease transmission.

Take care not to crush or puncture the tick during removal. Rocky Mountain spotted fever may be acquired from infected tick body fluids that contact broken skin, the mouth, or eyes. Do NOT use a hot match or cigarette to remove a tick as this may cause the tick to burst.

Do NOT apply solvents or other materials to the tick to “stimulate” the tick to detach. Such treatments can result in increased tick salivation and disease transmission.

Avoid touching a tick with bare hands. Shield your fingers with a paper towel, wear rubber gloves, or use tweezers.

Grasp an embedded tick as close to your skin as possible (the area where the tick's mouthparts enter the skin) and use steady pressure to pull it straight out. Do not twist or jerk the tick, as its mouthparts may be left in the skin.

After tick removal, thoroughly disinfect the bite site and wash your hands with soap and water. The feeding lesion should be swabbed with a topical antiseptic to prevent secondary bacterial infection.

If you want to have the tick checked for disease, contact the Ohio Department of Health's Zoonotic Disease Program.

Ohio Department of Health, Zoonotic Disease Program
8955 E. Main Street, Building 22
Reynoldsburg, OH 43068
Phone: 1-888-RABIES1
E-mail: Zoonoses@odh.ohio.gov

This article adapted from *Ticks OSU Extension Fact Sheet* HYG-2073. The full version is available at <http://ohioline.osu.edu/hyg-fact/2000/pdf/2073.pdf>

Feral Swine Disease Surveillance in Ohio

Craig Hicks, Wildlife Disease Biologist, USDA, APHIS, Wildlife Services

Introduced to the continental United States in 1539, feral swine are rapidly becoming established throughout the country. It is estimated that wild breeding populations of feral swine are now present in at least 39 states. Having many common names such as feral hog or pig, Eurasian or Russian wild

boar, razorback, and piney woods rooter, all are considered to fall under the same ancestral genus and species of *Sus scrofa* and have become established in several areas of Ohio.

Feral swine cause significant damage directly to valuable agricultural and natural resources each year in the United States. In 2000, it was estimated that the total damage caused by feral swine in the United States was approximately \$800 million annually. Since then, feral swine distribution has expanded greatly, increasing this figure considerably.

Much like their domestic lineage, feral swine are omnivorous feeders and will consume almost anything in their path. Since their diet consists primarily of vegetation, rooting can lead to



Trail camera captures a herd of feral swine visiting a bait station on public land in Southeastern Ohio.



Trail camera captures a herd of feral swine visiting a bait station on private land in Southeastern Ohio. Photos courtesy of Craig Hicks, USDA-APHIS-Wildlife Services

increased soil erosion and colonization of invasive species such as garlic mustard and bush honeysuckle. Foraging on crops can be extremely damaging. Feral swine damage to standing corn resembles the aftermath of an errant steamroller. As a predator, feral swine will consume invertebrates, smaller vertebrates, eggs of ground nesting birds, reptiles, amphibians, small mammals, and even the young of larger mammals such as white-tailed deer and livestock.

In addition to physical damage concerns, feral swine are highly mobile disease reservoirs and can carry at least 30 significant viral and bacterial diseases, as well as a minimum of 37 parasites that can affect people, pets, livestock and wildlife. Wildlife Services, a program of the United States Department of Agriculture's Animal and Plant Health Inspection Service, is conducting disease surveillance in feral swine populations throughout the country. Each year, the Ohio Program of Wildlife Services collects serum and tissue samples from feral swine to test for Classical Swine Fever, Swine Brucellosis, Pseudorabies Virus, Porcine Reproductive and Respiratory Syndrome, *Campylobacter*, *Escherichia Coli*, *Salmonella*, and *Staphylococcus*. Through intense surveillance efforts, we can better understand and address the serious threats that feral swine pose to Ohio's agricultural and natural resources.

As the population of feral swine increases, sportsmen and women alike are encouraged to pursue and harvest these highly destructive animals. Responsible hunters serve a vital role in controlling feral swine populations in the heavily forested, unglaciated region of Ohio. For hunting opportunities, outdoorsmen and women should concentrate their efforts on state and federally managed land in the southeastern portion of the state. Successful hunters are urged to wear rubber gloves when field dressing and processing raw products, properly disinfect all butchering and cooking utensils, and cook the meat to an internal temperature of 165 degrees Fahrenheit.

Wildlife Services can assist landowners in alleviating damage and disease concerns by setting traps to capture feral swine for disease surveillance. For assistance of this nature, landowners can call Wildlife Disease Biologist Craig Hicks at 1-866-4-USDAWS. Farmers, hunters, and other outdoor enthusiasts are encouraged to report all feral swine sightings to the Ohio Division of Wildlife at wildinfo@dnr.state.oh.us.

Critter Corner



The Northern Cardinal

Marne Titchenell, OSU Extension Wildlife Program Specialist

The Northern Cardinal, our state bird, is one most of us recognize immediately for their brilliant red color, as well as their sweet, whistling song. While

Male cardinal feeding his mate.
Photo courtesy of Tam Stuart, www.tamstuart.com



few North American female songbirds will sing, the female cardinal is one that does! She often sings from her nest, most likely to let the male know when to bring her food. Though the cardinal has as many as 16 different songs, the one we hear most often is a loud chirp. Cardinals will use this call for many reasons; when danger is near, as females approach their nests, when the parents are trying to get nestlings to leave the nest, or when a male is warning intruders of his territory. In fact, both male and female cardinals are very territorial and will spend hours attacking an intruder. Unfortunately, sometimes that intruder is their own reflection in a window or glass surface! If you encounter a cardinal repeatedly running into your window, simply cover the window with newspaper for a few days or soap the outside of the window to remove the reflection.

Since Cardinals are primarily seed eaters, they will frequently visit bird feeders. Putting up bird feeders can benefit cardinals in any season of the year, especially during winter when other food sources

are scarce. However, leaving feeders up during the spring and summer can provide an extra source of food during the nesting season, a time when both male and female cardinals could use a little extra energy! Backyard feeders can also allow a glimpse into the secret lives of cardinals. Look for mating rituals, like food sharing, where the male feeds the female. But be sure to include sunflower seeds in the bird seed mixes, as they are one of the cardinal's favorite foods!

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May 20 th	Bats: Not Just for Caves Anymore Cox Arboretum, Dayton
June 8-10	Plant Diagnostic Academy Cincinnati Zoo
June 10 th	Bats: Not Just for Caves Anymore Dawes Arboretum, Newark
June 18 th	Name That Tree Cox Arboretum, Dayton
July 8 th	Name That Tree Clark County
July 23 rd	Managing Grasslands for Wildlife Gwynne Conservation Area, London
July 24 th	Ponds With a Purpose Gwynne Conservation Area, London
Sept 21-23	Farm Science Review Molly Caren Agricultural Center, London

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