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NF05-653 Pyemotes Itch Mites

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Kalisch, James A.; Keith, David L.; and Broce, Alberto R., "NF05-653 Pyemotes Itch Mites" (2005). *Historical Materials from University of Nebraska-Lincoln Extension.* Paper 1737.
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Published by University of Nebraska–Lincoln Extension, Institute of Agriculture and Natural Resources

NF653

Pyemotes Itch Mites

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Two North American species of itch mites — the straw itch mite[1] and the "oak leaf gall mite"[2] (Family Pyemotidae) — are found in Nebraska and Kansas. The straw itch mite was known in the early 1900s as a nuisance pest after farm workers handled small grains. Wheat, oats, and barley were often infested with insects on which the itch mites fed, allowing them to reach large numbers by harvest. Farmers were familiar with the irregular red bites with a raised, hard nipple or pustule in the middle. Because the straw itch mite also can feed on immature stages of stored grain pests, individuals handling infested grain and harvested grass seeds also can serve as unsuspecting targets.

The oak leaf gall mite recently discovered in galls on pin oaks (*Quercus pallustris*, see *Figures 1, 2 and 4*) in Lincoln, Neb., and in Manhattan, Kan., is believed to be a relatively recent introduction to the United States. It was found in insect galls in Colorado in 1955, but was not identified again or associated with bites until August 2004, following an outbreak of red, itching welts on people in Nebraska, Kansas, Missouri, and Texas. Specimens collected in Kansas from marginal leaf fold galls were submitted for identification to experts at the U.S. Department of Agriculture, the U.S. Forest Service, and the Florida Division of Plant Industry. Mite specimens were identified as *Pyemotes herfsi* (Oudemans), a European species. This itch mite feeds on larvae of the midge (gnat) that forms the leaf galls. Midges were collected from marginal leaf fold galls (see *Figure 3*) on pin oak trees in Manhattan, Kan., and identified by Dr. Raymond Gagne of the U.S. Department of Agriculture as a species of Contarinia[3], a relative of the sorghum midge and Hessian fly.

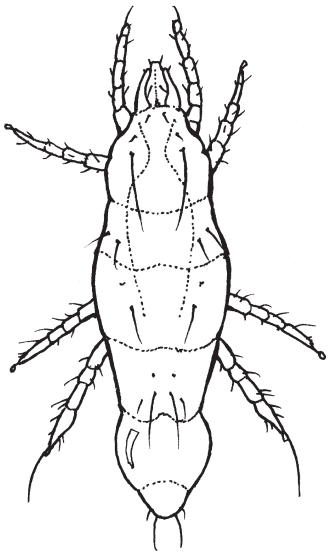

Figure 1. Young female oak leaf gall mite (an itch mite)

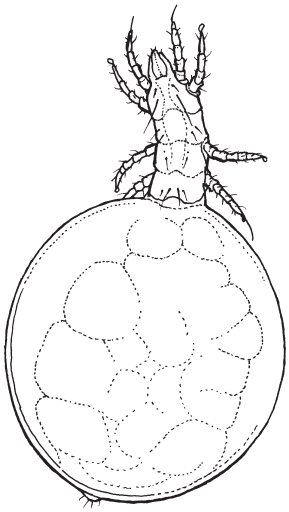

Figure 2. Sexually mature (gravid) female oak leaf gall mite

Itch Mite Bites

Itch mites have tiny, piercing mouthparts (stylet length of 15 microns or about 1/1700 inch) through which they inject a neurotoxic saliva into their insect host. Host insects become immobile in minutes and shrivel to a shapeless mass as the mite feeds. The first signs of itch mite attack on humans are

[1]*Pyemotes tritici* (Lagreze-Fossat & Montane)
[2]*Pyemotes herfsi* (Oudemans)
[3]Order Diptera: Family Cecidomyidae

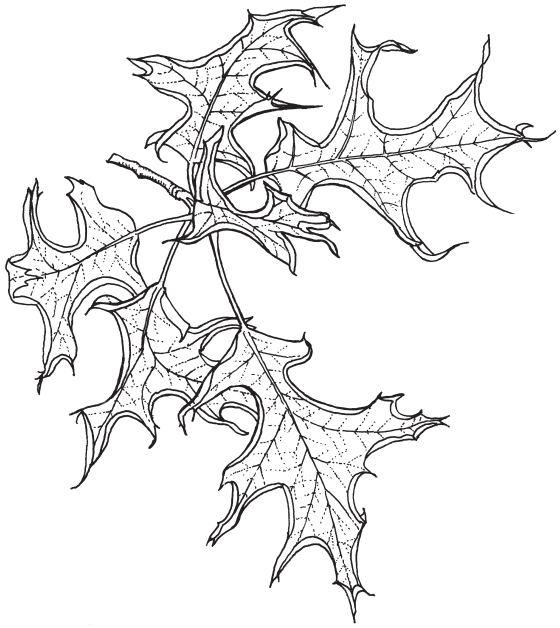

Figure 3. Marginal leaf fold galls on pin oak

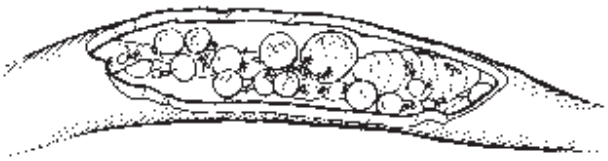

Figure 4. Gravid female itch mites feeding on gall midge larvae inside marginal leaf fold gall.

red welts on the neck, face, arms and upper torso. Normally, bites are not found on the legs, which distinguishes these bites from those of chiggers, which are often found on legs.

Booth and Jones (1952) described a typical straw itch mite skin eruption as similar to that caused by *P. herfsi*, "The characteristic, cutaneous lesion is a rosy-red wheal surmounted by a vesicle that rapidly becomes a pustule." The pustule, which has a wheal diameter of roughly 0.3 cm, occurs 10-16 hours after mite exposure. Pruritis can lead to secondary skin infection. Sometimes, signs of systemic infection occur, including. . . "fever, chills, malaise, headache, backache, vomiting and nausea." Most itching occurs during the first 10 days and bites persist for about two weeks, unless they become infected. While severe bite victims (up to 100 or more bites) and a few very sensitive individuals have been hospitalized, there is no known instance of a human death due to itch mites. During the 2004 outbreak, the bites were variously (and mistakenly) diagnosed as spider bites. Entomologists at Kansas State University reported bites on dogs and cats as well as on humans during this outbreak.

Itch Mite Life Cycle

In April 2005 gravid (pregnant) female oak leaf gall itch mites were found inside old oak galls, which indicates mated adult females may overwinter in galls on fallen oak leaves. By early to mid-July, female mites were found inside a few marginal leaf fold galls and other galls on a few oak trees.

Once a female itch mite (*Figure 1*) finds a potential host, she inserts her stylets and secretes the toxic saliva which will paralyze the host within minutes. The female will immediately begin feeding on the paralyzed host and, as she feeds, her abdomen will start to swell. The gravid female (*Figure 2*) is essentially incapable of movement and has a globular body measuring up to 1 mm (about 0.039 inch) in diameter. In just 7 days, each female can produce 250 or more mites in her abdominal sac. These mites will emerge as adult mites, ready to reproduce. About 10 percent of the offspring are males, which emerge first and remain nearby to quickly mate with newly emerged females.

Newly emerged adult female mites are yellowish and tiny — measuring about 0.2 mm (about 1/125 inch) in length, making them barely visible without magnification. Males die soon after mating, but females must find a host insect soon to produce the next generation. This cycle is repeated as long as food is abundant and conditions are suitable.

Itch mites have one of the shortest animal life cycles, allowing it, if conditions are favorable and prey is available, to multiply rapidly many times each season, producing millions of mites. With the oak leaf gall mite, the abundance of gall midge larvae is a key factor in itch mite outbreaks.

In the late summer, mature leaf gall maggots emerge from galls and fall to the ground, leaving the predatory mites without a food source. Soon after, the mites begin to disperse, dropping from oak trees and becoming airborne over a period of several weeks. Catches of mites on flat sticky trap surfaces indicate that when it is calm, mites simply drop from trees. Traps placed vertically show mites on both sides, indicating that many are blown by the wind. In 2004, the first bites were reported from early to mid-August, but mites were still active and biting as late as December 7.

Prevention and Control

If mites are identified, do not cut or remove oak trees. Every tree with or without mites, is precious and of significant value to you as a property owner. Remember that these mites, associated with oak galls, are not likely to be bothersome every year. Also, shade trees add value to your property and reduce your air conditioning bill in summer while reducing the effects of drying by slowing winds.

Prevention

To avoid these pests and their bites:

- Keep an eye on the newspapers and other media sources (radio, TV and the Internet) for itch mite warnings from experts at your local extension office and Land Grant University.

- Check the University of Nebraska Department of Entomology Web site at: *http://entomology.unl.edu/* and the Kansas State University Department of Entomology Web site at: *www.entomology.ksu.edu/*
- Watch for signs of bites, normally from mid-summer to fall, after working outdoors.
- If margined leaf fold galls are abundant on trees, be aware that mite activity is possible. To avoid them, you can remain indoors. Don't sit under oak trees or on the lawn. Keep windows shut in August-October when "mite showers" can occur.
- When working outdoors, especially if raking leaves, wear long sleeves, long pants and a hat. Use an insect repellent containing DEET or picaridin. Avoid direct handling of leaves and lawn clippings.
- Remove clothing items each day and launder them, since mites can remain in the fabric for several days. Take a warm shower soon after coming indoors, since the mites need about four hours on your body to produce a bite.

Control

There is some preliminary evidence that treating the lawn beneath previously infested pin oaks with an insecticide in early spring *may* reduce gall formation in the trees and the itch mites' food source. The tiny, dark brown, gall gnats emerge from the soil early on sunny mornings in April or May, usually when winds are calm and relative humidity is high. However, until more comprehensive research studies have been done, this treatment is not recommended as an itch mite preventive.

If turf beneath pin oak trees becomes infested due to "mite showers" in the fall, an insecticide labeled for chiggers may reduce itch mites. Several insecticides are registered for control of chiggers or mites in turf. These are listed on the Nebraska Department of Agriculture Web site at *www.kellysolutions.com/ne/*.

Follow label instructions carefully to achieve good results and protect humans, pets, other animals and the environment.

References

Booth, B. H. and Jones, R. W., 1952. Epidemiological and clinical study of grain itch. JAMA Vol. (150): 1575 - 1579.

UNL Extension publications are available online at *http://extension.unl.edu/publications*.

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Issued September, 2005

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