



THE AMERICAN HORNET MOTH IN THE URBAN FORESTS OF NORTHERN ARIZONA ABOVE 6000 FOOT ELEVATIONS

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Hosts

The American hornet moth, *Sesia tibialis*, is a serious pest of several species of poplars and willows in the higher elevations of northern Arizona. Aspen are a particularly favorite host.

Range

Widely found throughout much of southern Canada, and the northern United States including the states of the southern Rocky Mountains and California.

Description

Unlike the bark beetles that infest the ponderosa pine of northern Arizona, these pests are a lepidopterous insect. The insect order, Lepidoptera, are the moths and butterflies. The clear wing moths, a common name for this type of moth, are easily confused with other insects. The larvae look similar to roundheaded, wood-boring beetle larvae and the adults resemble wasps and hornets.

Adults are about one inch long and are wasp-like in appearance. They are black with yellow stripes and accents, and with clear wings (Fig.1). Hence the confusion with wasps and hornets. The adult emerges from an infested tree in the late spring through early summer by boring a ¼ inch hole near the base of the tree. As the adult exits, a telltale brown paper-like pupal case will be left protruding from the tree (Fig.2). After mating females deposit 200-600 eggs in the cracks and crevices of the host trees. Adults only live for four to ten days.

Eggs are oval and light to medium brown. The surface of the egg has a net like appearance. At hatching the larva is 1/20 inch long. Larvae are offwhite in color, and grow to 1½ inches long with a black head (Fig. 3). Larva have poorly developed crochets on the abdominal prolegs. When the larvae mature they form a two inch long by half inch diameter cocoon from the wood chips (Fig.4). The larvae spend two years in the tree.

Damage

The larvae of these moths damage the tree by boring into the wood of the tree. They form extensive tunnels generally



Figure 1. American hornet moth adult. Note the moth-like antennae.



Figure 2. Pupal case from emerged clear wing moth.

at the base of the tree, feeding in the lower trunk, root collar and exposed roots. Trees can be killed and are susceptible to wind throw during wind storms. Upon hatching the larvae crawl down to the soil line and bore into the tree. While in the tree they feed upon the live wood, forming tunnels about 3/8 inch in diameter and three to five inches long. They tend to feed in the lower trunk, root crown and exposed roots. Trees can have multiple attacks, with fifty larvae being found in one aspen in Flagstaff, Arizona. All sizes of trees are fed upon. The smaller the tree the greater the potential damage.

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Figure 3. American hornet moth larvae.

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Figure 4. American hornet moth pupal case.

Control

The best defense against this pest is a healthy tree. Healthy aspen are achieved by adequate watering, controlling scale, and reducing wounding to the bark. Adequate watering of aspen means that it gets a good soaking around the drip line of the tree about every two weeks during the growing season. Scale can be removed from the trunk and limbs with a scrub brush. (For additional information on the control of scale refer to *Oystershell Scale in Northern Arizona Above 6000' Elevations*, University of Arizona, College of Agriculture and Life Sciences Bulletin AZ1248.)

To prevent larval feeding, an insecticide sprayed on the lower three feet of the tree prior to the emergence of the adults, can kill the next generation of newly hatched larvae.

Once the American hornet moth has attacked the tree there are several methods of control. For infestations in a few trees it may be easiest to physically remove the larvae

from their tunnels. Dig around the base of the tree to expose tunnels in the root crown. Cutting away dead bark and wood will further expose additional tunnels. Pushing a stiff wire into the tunnels can be very effective at killing the feeding larvae and pupae.

An insect-feeding nematode, *Steinernema carpocapsae*, can be suspended in water and injected into the tunnels with a squeeze bottle applicator. These nematodes seek out the larvae and parasitize them. Once they have penetrated the host, they emit a toxin to inhibit the insect's inductive immune system. At the same time an insect-pathogenic bacteria is released that kills the larvae within 48 hours. The bacteria and the nematode have a symbiotic relationship. The nematode carries the bacteria to the insect host upon which the bacteria feed. In return the bacteria creates ideal conditions in the insect for nematode growth. Subsequent generations will continue to seek out hosts to parasitize.

References

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