



# Pest e-alerts



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## Got Grasshoppers? Get After Them NOW: Management Options in Rangeland and Pastures

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Grasshoppers are in an upward cycle for causing problems in Oklahoma. We have endured 3 years of severe drought which has let them increase in numbers. Grasshoppers have been hatching for several weeks now, and are about  $\frac{1}{4}$  inches in size. Even though they are small and don't seem to be causing much damage, now is the best time to control them because when they get big, they are difficult to control and will cause severe damage.

Scouting for grasshoppers takes some practice, but here is the way to get an estimate of populations. Go out and start by getting a "practiced eye" for looking at a 1/square yard area. Look at least 10 feet in front of you and begin walking to that square yard spot. Count the number of grasshoppers that jump out of the spot (don't count ones that jump in). Take several counts in your pasture to get an average number of grasshoppers per square yard. Make sure the samples are representative of the pasture (space counts at least 75 feet apart). If one square yard is hard to visualize and keep count, switch to a 1 square foot area, and add up all of the grasshoppers that jump out of 9 square foot samples. 9 square foot samples = 1 square yard.

Grasshopper control in rangeland is probably never justified until numbers exceed 12 per square yard. We suggest that a threshold of 24 or more SMALL grasshoppers (less than ½ inches long) per square yard is a starting point for deciding whether to spray or not. The threshold for larger grasshoppers (greater than ½ inch long) is from 12-40 per square yard. Sprays are most effective if timely and practiced over large areas. The best time to control them is from mid-May through about July 1, while they are wingless. Once grasshoppers sprout wings, they can fly for miles in search of food. There are three options that a producer might consider:

**Spot Treatments in Hatching Areas or Border Sprays:** Grasshopper eggs are often deposited in concentrated egg-laying sites, in pastures, ditches and untilled field margins. Grasshopper nymphs tend to remain in their hatching areas for some time after they emerge. So, spot applications of an approved insecticide in those areas can effectively reduce grasshopper numbers.

**RAAT Treatments with Diflubenzuron:** Diflubenzuron (Dimilin) was registered for use in rangeland and pastures to control grasshoppers. It disrupts the molting process of grasshoppers and must be ingested to be effective. Because of its specific activity on the invertebrate molting process, it is very non-toxic to vertebrate wildlife but should not be applied to ponds or streams. It must be ingested to be effective, so it has minimal impact on beneficial or non-target insects. Finally, it is inexpensive compared to other registered products.

Dimilin can be used in an IPM approach called a Reduced Agent and Area Treatment (RAAT). With this strategy, the rate of the chemical is lowered, and applied in alternating treated and untreated strips. It takes advantage of the grasshopper's natural tendency to move as they feed. As they move from untreated to treated areas and eat foliage treated with diflubenzuron, they are killed when they try to molt. An additional benefit of a RAAT application is that it covers less pasture with a pesticide application, thus reducing the impact of the spray on beneficial and non-target organisms. RAAT applications can be made with an aerial or ground application, but diflubenzuron is the only insecticide that specifically allows a RAAT application. A RAAT treatment can reduce application costs by 50-60% and 65-70% less insecticide is applied compared to conventional broadcast treatments.

**Broadcast Applications:** A producer can apply a registered insecticide as a spray or bait to control grasshoppers. It may be justified in improved pasture where hay will be harvested as a cash crop, but for grazing purposes, consider the cost of supplying hay versus spraying before making such a decision to treat. Several new insecticides have been registered for control of grasshoppers. They include Besiege, Declare, and Prevathon. Rates and additional information about all insecticides registered are listed in EPP-7193 "Management of Insect Pests in Rangeland and Pasture". For more information, check out EPP-7196, "Grasshopper Management in Rangeland, Pastures, and Crops".

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## Red Spiders or Wheel Bug Nymphs?

Eric Rebek, Extension Entomologist

During my regular extension rounds throughout Oklahoma this spring, I have seen a large number of wheel bug, *Arilus cristatus*, nymphs emerging. Some folks mistakenly identify these fascinating critters as red spiders due to their arachnid-like appearance. Upon close examination, however, they have only six legs and one pair of antennae that resemble a fourth pair of legs. In contrast, spiders are eight legged and lack antennae altogether.

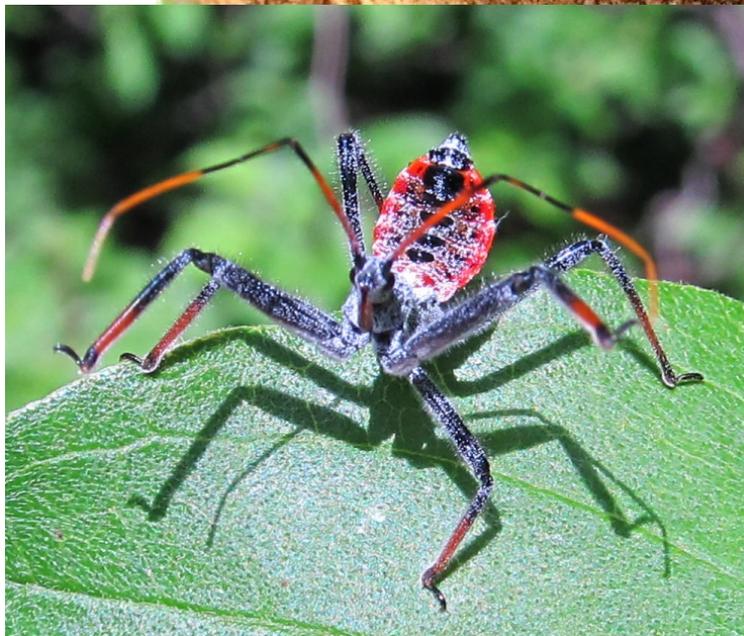


Photo credit: Eric J. Rebek

Because wheel bug adults and nymphs are predators of a wide array of garden pests, their presence in the landscape should be rejoiced, not feared. They are especially fond of caterpillars, beetle larvae, aphids, sawflies, and other soft-bodied insects. Therefore, control is not warranted since they are beneficial insects. Wheel bugs are just one of many species of assassin bugs that are encountered commonly around Oklahoma landscapes. I see these interesting bugs on trees, shrubs, flowering plants (including weeds), and many horticultural crops, but wheel bugs are prevalent wherever their prey are abundant.

### **Description**

Adults range from dark gray to brown and measure 1 to 1¼ inch long. These large assassin bugs have long legs and antennae, large beak-like mouthparts (rostrum), a narrow head, and large eyes. The common name “wheel bug” reflects the large, semicircular crest on the dorsal surface of the thorax that resembles a cogwheel. The number of “teeth” (tubercles) on the crest ranges from eight to twelve. Young nymphs have orange to bright red abdomens and the thorax, head, legs, and first half of the antennae are black. The distal portion of the antennae is dull yellow. The brightly colored nymphs become darker as they mature and the crest or “wheel” is absent



until they reach the adult stage. Eggs are brown with white “caps” and measure less than 4 mm. They are laid side by side in clusters of 50 to 175 eggs.

### **Life Cycle**

There is one generation of these assassin bugs per year. Wheel bugs overwinter as eggs that are laid on tree trunks and limbs, shrubs, and other places. In Oklahoma, nymphs begin to emerge mid to late spring, depending on temperature. This year, mass emergences of nymphs have occurred since the middle of May. There are five nymphal instars, each lasting from 2 to 3 weeks; thus, nymphs are seen for approximately 3 months. Adults are present toward the end of summer through late fall. All life stages are active hunters during the day, although adults can be captured near lights at night.

### **Feeding**

Wheel bugs use toxic saliva to immobilize and kill their prey. After injecting the saliva into their prey, they suck out fluids from the body using their straw-like, piercing-sucking mouthparts. These insects can be cannibalistic, and females have been reported to consume the smaller males after mating; femme fatales, to be sure!

## Medical Importance

Wheel bugs are capable of inflicting a painful bite when disturbed, so they should be handled with care. The bite has been described as being more painful than bee or wasp stings. The wound site should be washed and treated with antiseptic. Typically, the resulting wound is not serious, but it may be numb for several days and turn red, then white and hardened. A small puncture hole may be seen at the wound site. Seek medical attention immediately if any signs of anaphylaxis develop, such as swelling, itching, hives, or difficulty breathing.

## References

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## Heartland Virus and Lone Star Ticks

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### Heartland Virus

Heartland virus is a recently described virus transmitted by ticks in the Central United States. As of May 2014, 10 cases have been identified in patients in Missouri, Tennessee, and Oklahoma – 2 of which died due to complications. Cases to date have occurred between May and September. The virus appears to only be transmitted by Lone Star ticks (see below for description). Because this virus was only identified in 2012, the factors which make persons most at risk for acquiring Heartland virus have not yet been determined. However, like other tick-borne illnesses, those who work outside or engage in outdoor activities (hunting, hiking and walking in wooded trails) and are exposed to lone star tick bites are more likely to become infected. Similar to human monocytic ehrlichiosis, the flu-like symptoms of Heartland virus may include fever, tiredness, headache, nausea, lack of appetite, muscle aches, bruising easily and diarrhea. An identifying feature is when patients do not improve after being treated by antibiotics for 7 days.

### Lone Star Tick [*Amblyomma americanum* (L.)]

The lone star tick is a three-host tick and is an important pest of all livestock and wildlife. Larvae, nymphs and adult stages of this species readily feed on humans. The lone star tick is the one most commonly encountered by people during recreational activities in Oklahoma. Ticks quest for hosts along trails and pathways. The larval ticks quest together in a mass and can infest more than 40 different species of wild and domestic birds.

The tick receives its name for the large white spot on the dorsal shield of the female. The male has white markings around its posterior margin. This species has longer mouthparts than the tick species previously discussed.

The lone star tick is active from early spring to late fall. The female is capable of laying 9,000-12,000 eggs. This species is one of the most important ticks from a public health standpoint because it is known to transmit human monocytic ehrlichiosis (*Ehrlichia chaffeensis*), southern tick-associated rash illness (STARI), canine granulocytic ehrlichiosis (*Ehrlichia canis*), tularemia (*Francisella tularensis*), Heartland virus, and a spotted fever type of disease (*Rickettsia amblyommii* is suspected to be the cause).



Lone Star Tick (*Amblyomma americanum*) female (L) male (R).

### Methods of protection from ticks

- 1) Avoid heavily-infested tick areas, especially in the spring and early summer.
  - Stay on cleared or prepared trails or paths.
  - Avoid tall grasses or bushy overgrown areas and areas covered with large amounts of leaf litter.
- 2) Wear protective clothing.
  - Wear light colored clothing so ticks can be seen easily and removed before they attach.
  - Wear long pants and tuck pant legs into boots or into high socks.
  - Wrap tape (masking tape works well) around the cuffs of your pants with the sticky side out. Ticks will be captured on the tape.
  - Wear boots or closed toe shoes.
- 3) Use a repellent that indicates it works well against ticks.
  - Many repellents contain DEET (N, N-diethyl-M-toluamide) which can be placed on the skin or on clothes. Concentrations of 20 to 40% or greater work best. DEET is sold under several different trade names.

- Additional tick repellents contain the insecticide permethrin, which should be sprayed onto clothing where it remains effective for up to three washings. Do not apply to the skin. Read instructions carefully, as it is harmful to some fabrics.
- 4) Protect your pets and premises from ticks.
    - Inspect pets frequently for tick infestations. Remove ticks or treat for them.
    - If your yard or premises is infested with ticks, treat it with the recommended insecticides.
  - 5) Frequently inspect yourself and other family members for the presence of ticks, especially children, at least every two- to three- hours if you are in a tick-infested area.
    - Examine the head and hairline especially close. The waistline and other tight spots should also be surveyed.
    - Crawling, unattached ticks cannot transmit disease and are easily removed.
  - 6) Properly remove attached ticks.
    - Use tweezers to grasp the tick at the surface of the skin.
    - If you do not have tweezers, use tissues or a cloth to protect your fingers and to grasp the tick firmly. A Ziploc bag turned inside out works very well for this purpose. (Protection of your fingers is necessary because you could accidentally crush the tick. The ticks body fluids could be infected and contaminate your fingers. You could accidentally introduce the disease organism into the mucous membranes or a scratch or wound.)
    - Pull the tick straight out with a slow steady pull. Do not be alarmed if the tick head (mouthparts) stays in your skin. Your body will take care of this wound and heal without removing the head. The important thing is to stop the potential for the tick to secrete disease organisms into the feeding site by severing the connection between the tick and your skin.
    - Do not try to remove ticks with a match or other hot objects, as this is likely to cause a burn. In addition, folk methods of using alcohol and Vaseline to suffocate the tick are not effective.
    - Record the date of tick bite and save the tick (freeze in the Ziploc bag used for removal) in case you become ill.
  - 7) To prevent tick populations from building up in your yard, keep ticks off your pets, keep your lawn mown and prevent the growth of tall grass, weeds or brush in fence lines and around shrubbery.
  - 8) Landscaping Tips to Reduce or Limit Tick Access to Your Property:
    - Remove leaf litter and clear tall grasses and brush around homes and at the edges of lawns.
    - Place wood chips or gravel between lawns and wooded areas to restrict tick migration to recreational areas.

- Mow the lawn and clear brush and leaf litter frequently.
- Keep the ground under bird feeders clean.
- Stack wood neatly and in dry areas.
- Keep playground equipment, decks and patios away from yard edges and trees.

9) Do not use pet tick and flea collars on humans to repel ticks.

10) Discourage deer from entering your lawn.

11) Bait boxes that treat wild rodents with acaricide (insecticide that kills ticks) are now available for home use. Properly used, these boxes have been shown to reduce ticks around homes by more than 50 percent. The treatment is similar to products used to control fleas and ticks on pets; it does not harm the rodents. Bait boxes are available from licensed pest control companies.



**Landscaping for homeowners to provide a tick migration zone for targeted pesticide applications. Source: cdc.gov**

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