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Red Fire Bug — A New Idaho Invader?

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Description

THE RED FIRE BUG, *Pyrrhocoris apterus* (Heteroptera: Pyrrhocoridae), is an introduced and invasive true bug with a vividly colored red and black body. Red fire bugs are about ¼" to ½" in length depending upon the life stage, with adult females being the largest. The native range of these insects extends from Europe, eastward through Mongolia, and into northwestern China. It was first discovered and identified in the United States in 2008 near Salt Lake City, Utah. Exactly how these insects entered the country is unknown. Since their introduction and establishment, this insect has expanded its known range in the United States to include southern Idaho, with numerous specimens and populations first found in 2021 near Twin Falls and Burley, Idaho.

Red fire bugs are strikingly colorful, with alternating black and red coloration (Figure 1). Adult females and males can be polymorphic with respect to their wing development. They may be apterous (wingless), brachypterous (short-winged), or macropterous (fully winged). Most populations

Figure 1. Brachypterous red fire bug adult.

Figure 2. Red fire bug nymph, showing the developing external wing pads and three black dots on the abdomen.

Figure 3. Brachypterous red fire bugs aggregating on a linden (*Tilia* spp.) seed.

have been reported to be 90% apterous, 5% brachypterous, and 5% macropterous. The antennae, head, and lower portions of legs of the red fire bug are entirely black. The antennae are four-segmented and the two compound eyes are black and protrude from the side of the head. Another feature that may help identify red fire bugs is their lack of simple eyes (ocelli), which—in many other species of bugs—appear as black dots directly on the top of the head. As seen from above (dorsal view), the pronotum, thorax, and abdomen are red along the margins; two prominent black spots and two smaller spots on the wings (hemelytra) characterize the coloring of adult red fire bugs.

Life Cycle and Host Plants

Red fire bugs go through "incomplete" (hemimetabolous) metamorphosis with three life stages (egg ⟶ nymph ⟶ adult) and have one generation per year in temperate regions. Eggs are very small, ~1/32" (1 mm), almost invisible to the naked eye and are white in color. Eggs hatch about two weeks after they are laid, turning a salmon color as they develop. Nymphs are bright red and, as with most true bugs, their wings develop externally as wing pads (Figure 2). Nymphs undergo a total of five nymphal instars, molting each time and developing into adults in about two weeks, depending upon ambient temperatures and adequate food supply. In Idaho, nymphs may resemble nymphs of native boxelder bugs (see UI Extension CIS 1155, *Boxelder Bug: Nuisance Management for Homeowners*), *Boisea trivittata*, but red fire bugs appear overall redder with a red-margined pronotum and black dots on the dorsum of the abdomen.

After reaching adulthood, adults begin mating in the late summer or early fall. As temperatures and day length decrease, red fire bugs search for protected overwintering sites (including homes/sheds/shops and the like). In the early spring, females begin laying eggs for the new generation; each female may lay hundreds of eggs, mainly upon the soil surface.

As with all true bugs, red fire bugs have piercing-sucking mouthparts they insert into food sources to feed. They feed on seeds from a wide variety of plants but are most known for feeding on plants in the (mallow) plant family. Idaho has several dozen species of ornamental, rangeland, and weed plants that could potentially be acceptable host plants for red fire bugs, including mallow, globe mallow, checker-mallow, hollyhock, hibiscus, and linden trees. Scientific reports about this insect note they aggregate on black locust (*Robinia pseudoacacia*), spruce trees (*Picea* spp.), and linden trees (*Tilia* spp.), all common ornamentals in Idaho and prominent host plants in the red fire bug's native range; the fire bugs mostly feed on linden seeds that have dropped to the ground (Figure 3). Feeding on host plants found in Idaho is unlikely to cause damage that would warrant management actions. Red fire bugs may eat other insects (dead or alive), including each other, especially if food sources are limited. This varied diet and feeding habit (polyphagy) has likely contributed to the red fire bug's expansion and invasiveness throughout the world.

Pest Status, Management, and Possible Expansion throughout Idaho

Although red fire bugs are unlikely to damage host plants in Idaho, they may become a nuisance pest. Red fire bugs form large aggregations near plants and during late fall they may enter homes or other structures when seeking overwintering sites. Moreover, if handled roughly or disturbed, they may release a foul odor from scent glands on the first thoracic segment of their body. They also can regurgitate unpleasant smelling fluids from their gut. This combination of gathering in buildings and releasing foul-smelling odors makes the red fire bug a potential nuisance pest. Currently, there are no legal insecticides registered in Idaho for homeowner or commercial use to manage this insect.

If large populations exist near homes/buildings, we recommend implementing several management strategies (Integrated Pest Management) to help control red fire bugs as nuisance pests. First and foremost, "bug proofing" your home/building by sealing entry points is a key strategy. Improving weather stripping on loose-fitting exterior doors, caulking around windows, and repairing screen doors should reduce the ability of the bugs to enter homes/buildings. Using a standard shop vacuum to physically remove the bugs from homes/buildings will prevent foul odors or regurgitates from permeating or staining carpets and furniture. Deploying sticky traps around windowsills or entry points will physically capture red fire bug adults as they try to enter for overwintering purposes. Using diatomaceous earth as a barrier insecticide treatment around homes is a least-toxic alternative chemical approach. Lastly, several active ingredients are listed for use in Idaho as broad-acting nerve poisons or insect growth regulators for barrier insecticidal treatments. To be a lawful application, the label must specifically list the pest insect type and application location and must be labelled for home use. All pesticides, including least-toxic alternatives, have benefits and potential hazards. Please read and follow the pesticide label for specific directions, paying close attention to the directions for use and application rates. Inconsistent use of a product or disregarding the label is a violation of both state and federal laws.

Since their initial discovery in the United States near Salt Lake City, Utah, in 2008, this insect has spread throughout surrounding areas, including southern Idaho. As of 2021, sightings of red fire bugs in Idaho had only been reported in and near Twin Falls and Burley. Given the current establishment of this insect, wide availability of host plants, cold tolerance (5°F [-15°C] for up to two weeks), as well as genetic and phenotypic plasticity, it could be hypothesized that this insect might continue its expansion throughout Idaho. Fully winged individuals are good flyers and the long photoperiods and high temperatures that are typical of southern Idaho summers are surely favorable to their spread throughout the state.

ALWAYS read and follow the instructions printed on the pesticide label. The pesticide recommendations in this UI publication do not substitute for instructions on the label. Pesticide laws and labels change frequently and may have changed since this publication was written. Some pesticides may have been withdrawn or had certain uses prohibited. Use pesticides with care. Do not use a pesticide unless the specific plant, animal, or other application site is specifically listed on the label. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

Trade Names—To simplify information, trade names have been used. No endorsement of named products is intended nor is criticism implied of similar products not mentioned.

Groundwater—To protect groundwater, when there is a choice of pesticides, the applicator should use the product least likely to leach.

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