

What to Do about Those Pesky Grass Bugs?

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You may have noticed wheatgrasses in and around pastures and roadsides turning a blotchy yellow and sometimes straw color in early spring, when they should be green. This may be due to the feeding of a small, seldom-noticed insect known as the black grass bug (*Labops hesperius*). These pesky bugs suck fluids from plants through slender, piercing beaks located under their heads.

BGB are approximately $\frac{1}{4}$ inch long and mostly black, with a white to straw-colored lateral band along the outside edge of their wings. They have prominent, bulging eyes on the sides of their heads (Fig. 1). Immature stages, called nymphs, are smaller in size with prominent red to brown and white stripes and spots on the abdomen and head. Older nymphs have black wing pads (Fig. 2).

Black grass bugs are native to the western United States. These insects historically occurred in relatively low numbers in the region and were not noted to affect overall rangeland forage production by early settlers. Severe plant damage was first noticed around 1938, when damaged cropland and rangeland were reseeded with introduced wheatgrasses after prolonged drought during the Dust Bowl. Large plots of wheatgrass monocultures provided ideal habitat for the BGB, which led to population explosions.

Black grass bugs produce only one generation per year. Their eggs are deposited inside dried hollow grass stems, which protect them over the fall and winter. The eggs hatch in the spring when cool season grasses begin to come out of dormancy. Newly hatched nymphs usually feed starting in the late afternoon when the soil surface is warm. BGB drop down to the grass crowns and soil litter on cold days or when disturbed. As the nymphs mature, they become more active and feed during the day.

Nymphal BGB molt five times before becoming adults (Fig.2). In favorable weather conditions, the process from egg hatch to adult is usually completed within four to five weeks. Adult bugs actively feed and reproduce for roughly



Fig. 1. Adult black grass bugs. The typically larger female is on the left. They are approximately $\frac{5}{16}$ of an inch long. There are similar-looking species of plant bugs but in Wyoming, this species is the most common pest of wheatgrass pastures. Photo by UW Extension Entomology.



Fig. 2. Black grass bugs start out very small as their eggs will fit into hollow grass stems. The nymphs go through five growth stages, called instars, illustrated here. The last stage before adulthood is almost a $\frac{1}{4}$ inch long. The rate of development depends on the temperatures of the spring weather and nutrition. Photo by Aaron Clark, Wheatland, Wyoming.

five to six weeks before dying. Females begin laying eggs in last year's dry, hollow grass stems approximately two weeks after becoming adults. According to recent research from the University of Nebraska-Lincoln Panhandle Research, Extension & Education Center, BGB females have even laid eggs in the hollow stems of the invasive bulbous bluegrass, which dries out early in the spring.

BGB feed on a variety of grasses; even the edges of winter wheat fields next to infestations can suffer significant yield losses from leaf damage. However, crested wheatgrass and intermediate wheatgrass plantings make exceptionally good habitats for BGB. There is usually a delay of four to seven years between a new wheatgrass planting and an infestation of BGB, indicating the infestation may be caused by a population explosion of bugs already present in the pasture, rather than dispersal from neighboring populations.

As mentioned, BGB cause damage to plants by piercing the leaves and sucking out the fluids found within leaf cells. The bugs typically feed on the upper surface of the leaf, beginning at the tip and moving toward the leaf base. Once the insects start feeding, whitish spots appear because the bugs are removing the chlorophyll from the leaves. This results in heavily infested patches looking frosted or yellowish. In extreme cases, infested patches may appear straw colored.

Heavy infestations can prevent seed formation and reduce grass palatability for livestock. Although damaged plants will most likely recover with adequate moisture, infestations during drought may lead to some plant mortality.

While research-based economic thresholds have not been determined, damaging infestations have been observed from 100 BGB per square foot to more than 1,000 bugs per plant. When more than half of the grass leaf surface incurs BGB feeding damage, forage nutritional value for grazing livestock and general pasture health may decline (Fig 3.).

BGB population density can be sampled with a standard 15-inch diameter crop insect sweep net. During his thesis research in Niobrara and Goshen Counties, A. J. Kneeland (2010) found that late afternoon to evening was the best time to survey BGB with a net. This is because the soil is usually the warmest at the end of the day and the insects are the most active then.

In a study conducted by the University of Nebraska-Lincoln, researchers collected an average of about 39 BGB for each 180-degree sweep of the net in a heavily infested crested wheatgrass hay field. After small test plots in the field were treated with an insecticide containing the active ingredient Zeta-cypermethrin (found in Mustang Maxx and generic equivalent products) for BGB control, the results were





Photo Credit: Aaron Clark, Wheatland, Wyoming

an increase of 810 pounds of hay per acre when compared to the yields of untreated plots in the same field at harvest.¹

An integrated approach to BGB management may include cultural control such as heavy grazing. In early spring, grazing livestock may outcompete the BGB by utilizing early grass before the insects remove the nutrition from the leaves. However, this can negatively impact the grass plant's health and is not recommended as the BGB can concentrate their feeding close to the plant's crown on the remaining new growth.

When intensive grazing on an infested pasture is implemented in the summer or fall, the goal is to remove the dry stems containing BGB eggs or trample them into the soil. As the stems decompose, the eggs will die. However, note that this method can adversely affect livestock as they will be reluctant to consume the dried grass stems until hunger forces them to. Supplemental feeding of crude protein to your livestock will increase the digestibility of the BGB-damaged forage as they graze it down.²

Mowing or prescribed burning on BGB-infested pastures will also reduce BGB egg hatch the following year. These two control measures destroy the old, dry grass stems that contain BGB eggs as well as release nutrients that reinvigorate plant growth and ultimately improve grazing utilization.

Mowing infested pastures any time after the adult BGB have died off in the summer, but before the insects hatch the following spring, can destroy the bug's eggs. However, keep in mind that mowing comes with machinery, fuel, and labor costs. Also, depending on the type of grass and terrain, some infested pastures may be too rough to mow. Prescribed burning is another option, but be aware that it is associated with unique liability risks and costs.³

The use of insecticides to control BGB infestations during the pest's nymphal stages is also a viable control option. Insecticide treatment is most effective early in the spring after the majority of the population has hatched from eggs. There are many insecticides labeled for BGB; however, if

1 For more information, visit <https://cropwatch.unl.edu/2018/scouting-recommended-wheatgrass-black-grass-bugs>.

2 Refer to Chapter 5 "Supplementation and Substitution" in UW Extension's Cattle Management Manual (MP-97) in the reference list for more detailed animal nutrition information.

3 Wyoming Prescribed Burning Regulations (B-1354), a bulletin published by the University of Wyoming Extension, should be read in detail to determine the feasibility for each landowner. Visit <https://bit.ly/WY-prescribed-burning> to view the bulletin.



Fig. 3. Instead of counting black grass bugs, examining grass leaf samples from several parts of a field for feeding damage may be an easier way to determine if treatment is warranted. From left to right, the photos show 11–30%, 31–49%, 50–69%, and 70–100% BGB leaf damage. The principle of integrated pest management is that pest control should be implemented before the cost of pest damage exceeds the cost of treatment. If your livestock are only getting 50% or less of the non-fiber nutrients that the grasses should contain, what is the cost to your bottom line?

you want to treat a pasture without removing livestock, you must select a product with a zero-day grazing restriction.

It is important to select the right insecticide for the area being treated. All the products currently labeled for BGB are broad spectrum, contact-type insecticides. This means that any insect that comes in contact with a lethal amount of the active ingredient on the treated vegetation will be killed. This is not an issue in wheatgrass pastures in the early spring as there are very few beneficial insects, such as pollinators, due to the lack of flowering plants.

Insecticide selection also depends on if you choose to apply the product yourself or if you hire a professional applicator. Searching the key words *black grass bug* on a pesticide data website, such www.greenbook.net, will yield a long list of labeled insecticides. If you're planning to apply the insecticide yourself, you'll need to determine what products are available to you and what they will cost. If you hire a professional applicator, you will need to discuss with the applicator what they recommend for the pest. Correctly applying the chosen insecticide, after the majority of the BGB hatch but before they have done extensive feeding damage, is critical to success.

A. J. Kneeland (2010) found that a spray formulation containing 2.8 fluid ounces of the active ingredient zeta-cypermethrin (used in Mustang Maxx and generic equivalent products), per acre applied by spray plane, with sufficient carrier volume, per the product's label, resulted in excellent control. Previous BGB management

studies have shown that if you get excellent control from a treatment, it can often take several years for the BGB population to reach damaging levels again.

If your wheatgrass pasture conditions have deteriorated to the point that they are no longer productive, it would be better to remediate the pasture than attempting control of the BGB. When remediating a pasture, consider using a variety of grass species in combination with some forbs. It is theorized that the presence of flowering forbs makes the pasture more suitable for BGB predators, such as tiny insect parasitic wasps, that often rely on flower nectar for food as adults. Increasing natural predation may help keep BGB below economically damaging levels, resulting in populations similar to those found in the native prairie. The NRCS offers helpful information on pasture seed mixes recommended for our region.⁴

It is important to keep in mind that BGB may not need to be controlled every year, as their populations fluctuate depending on winter temperatures, snowpack, amounts of moisture, spring temperatures, and other events that disrupt their lifecycle. The key to effective control of the black grass bug, as with any pest, is correct identification, awareness of its life cycle, early detection, and timely treatment. ■

⁴ Visit <https://www.nrcs.usda.gov/conservation-basics/conservation-by-state/montana/plant-materials-montana-and-wyoming> to view NRCS recommendations.



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