

INSECTS

BY DAN L. JOHNSON

How to scout for pest and non-pest grasshoppers

Photos courtesy of Dan L. Johnson



Club-horned grasshopper

IN THE LAST FEW YEARS ONLY 2 SPECIES OF GRASSHOPPERS HAVE DONE THE BULK OF THE DAMAGE TO CROPS AND FORAGES. THE REST YOU CAN LEAVE ALONE

Grasshoppers have caused significant damage to land, crops, range and forages in many parts of the prairies and northern Great Plains. The warm, dry weather beginning in 1999 improved their survival, hastened development and encouraged successful reproduction. Grasshoppers have only one generation per year in Canada and the northern U.S., but several warm years in a row can magnify their numbers to surprisingly high counts. In June of 2003, I saw more than 800 clear-winged grasshoppers per square meter at several sites in central Alberta, a level about 100 times their normal density between outbreaks.

But not all grasshoppers are pests, and it helps to distinguish them if you want to reduce your use of insecticide, and also not assume that the peak of the problem has passed. There are actually 80 species of non-pest grasshoppers in western Canada.

Here are descriptions of 8 of the main non-pest species that you might encounter while scouting in the spring for the more devastating kind.

NON-PESTS

1. The club-horned grasshopper (*Aeropedellus clavatus*) is a small gray grasshopper in the group we call the

slant-faced grasshoppers, because of their pointed heads. This grasshopper is one of the most common insects found on pastures and roadsides in the spring and early summer. It's normally gray,



Velvet-striped grasshopper

black and tan, but it can be partly green and even white.

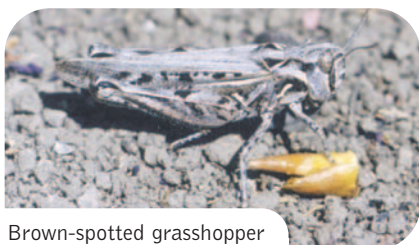
It can be recognized by the hourglass marking on the back called the pronotum, the short wings and especially by the knobbed antennae. No other grasshopper has such thickened tips on the antennae. Unlike most grasshoppers, the club-horned grasshopper is well adapted to

survival and development in cold conditions. This grasshopper hatches earlier in the spring than any other grasshopper.

All of the other grasshoppers found before May have overwintered in the active stages. The club-horned grasshopper can be very common in May and June of some years, and often confuses pest managers because it hatches more than a month before the pest species. It can be heard in June and July making a scritch-scratch-scratch-scratch sound in the grass, and a captured or even dead specimen will make a rasping noise if you hold the back legs by the feet and move the legs up and down against the sides. This grasshopper eats western wheat grass, needle and thread grass, and other native species, but it has a light diet.

2. The velvet-striped grasshopper (*Eritettix simplex tricarinatus*) is a small green and silver grasshopper with a sharply pointed head and 2 dark stripes, highlighted by light-colored stripes, running down the back. It's often found on grassy slopes and roadsides in April and May, not because it hatches early but because it overwinters as a grasshopper, not an egg. If you use a guide to identify grasshoppers, it will probably show that this species is found only in the extreme southeast corner of Alberta, and in

Saskatchewan near the U.S. border, but don't believe it. Either because of lack of collection efforts in the past, or because of the warmer weather lately, they now are right across southern Alberta and Saskatchewan, up to about Oyen and Leader. The main food for this species is blue grama grass and sedge, but it eats so little that it causes no harm.



Brown-spotted grasshopper

3. The brown-spotted range grasshopper (*Psoloessa delicatula*) is usually the first grasshopper found in the spring, appearing even earlier than the velvet-striped grasshopper and the club-horned grasshopper. They lay eggs that hatch in summer, unlike the pest species, which lay eggs in late summer that hatch in the spring. You can recognize this species by the early date, gray color (rarely green), constricted hourglass on the back, tiny colorless wings, and distinct black triangles on the back legs when seen from above.

Like the club-horned grasshopper, the brown-spotted range grasshopper is important food for the nestlings of grassland songbirds. This grasshopper eats native grasses and sedge but it causes no significant damage, and there is no reason to spray to control it.

4. In April you can find a dark brown or charcoal-colored grasshopper called the speckled rangeland grasshopper (*Arphia conspersa*). Its preferred habitat is native short grass on sandy soil. This grasshopper overwinters and begins feeding as soon as the spring temperatures warm up to 10°C or so. In March and April, the wing buds look like little triangular angel wings. In May, this hopper fledges and flies across the prairie on bright red wings with a clattering, buzzing sound. Grasshoppers such as this one are called the band-winged grasshoppers, because the hind wings, which are hidden under the forewings at rest, are colored or banded. Any grasshopper with a colored wing that is visible when it flies is not a pest.

5. The northern green-striped grasshopper (*Chortophaga viridifasciata*)

comes in either green or tan, but it can be recognized by the strong ridge on the back. No other grasshopper in early spring has such a sharp ridge (but later in the summer, the green fool grasshopper has an even higher ridge). The northern green-striped grasshopper has a yellow wing in flight, and tends to fly only short distances. It's not too common on the prairies in summer, but can easily be found in the early spring.

6. The heaviest (but not the longest) grasshopper on the prairies is the red-shanked grasshopper (*Xanthippus coralipes latifasciatus*). It spends the winters as a bumpy immature that looks a little like a tiny toad. The immature is usually brown, but can be olive green and gray or shades of tan. When it grows wings, they can be either red or yellow. This grasshopper is important food for burrowing owls. Coyotes seem to eat it in the early spring, and this might train the coyotes to search for grasshoppers later in the summer when the pest species are common. Parasitic flies attack this species, and we suspect that some of the maggots emerge and attack pest grasshoppers later.



Red-shanked grasshopper

7. The Mormon cricket (*Anabrus simplex*) is actually a katydid, a kind of long-horned grasshopper (meaning with very long antennae). This grasshopper caused trouble for the Mormons in the mid-1800s, and in 2001-2003 caused enough damage in the U.S. that spraying costs reach up to \$6 million per year. In Canada, it's not a pest at all, and is not a cause for worry, despite its huge size. The long point at the back end means it's a female, because that's an egg-laying device. The male sings a loud, long song. Any grasshoppers that sing are not pests.

8. The Carolina grasshopper (*Dissosteira carolina*) is a large band-winged (yellow and black) grasshopper that flies

like a butterfly and seems to disappear when it lands on bare soil. It's not normally a pest, but in places where the soil is so fine that it blows, this grasshopper can build up and cause minor damage to wheat or pastures. It usually looks much worse than it is, because of its size. It normally doesn't fly until July.




Carolina grasshopper

PESTS

The most common grasshopper pests in the Canadian prairies in 2002-2004 were the two-striped grasshopper (*Melanoplus bivittatus*) and the clear-winged grasshopper (*Camnula pellucida*). Both of these can occur in large numbers, and tend to eat crops down to the ground around the edge of the field or other choice spots. The two-striped grasshopper eats cereal crops, grass and broadleaf plants. The clear-winged grasshopper is mainly restricted to cereal crops and grass. They both overwinter as eggs and hatch in time to grow in June, so the date can help to separate them from the harmless species that overwinter and emerge earlier.

In the last 2 years, the lesser migratory grasshopper and Packard's grasshopper have increased across western Canada. They rank a distant third and fourth after the two-striped grasshopper and the clear-winged.

By the time summer comes, there are many more types of grasshoppers in the roadsides and pastures, but the simple rule after mid-June is that if a certain kind of grasshopper is not found in large numbers, then either it isn't a pest species, or it's a potential pest but it isn't causing enough damage to reasonably cause concern. 

Dan Johnson was a research scientist with Agriculture and Agri-Food Canada for over 20 years, and recently left to become a Professor of Environmental Science, and Canada Research Chair at the University of Lethbridge. His e-mail address is dan.johnson@uleth.ca