# Tips for Controlling Grasshoppers

## Eggs laid this summer and fall could produce forage robbers next spring.

*by* ***Troy Smith***

How much forage would a grasshopper eat, if a grasshopper did eat forage? They do, you know … eat grass and a lot of other green, growing stuff that would otherwise be forage for cattle. Grasshoppers can be tough on pastures and fields of small grains — which are grasses — and they often chow down on succulent crops such as alfalfa and soybeans.

An adult grasshopper consumes its own weight in green food every 16 hours, says University of Nebraska entomologist David Boxler. So, at an infestation rate of seven hoppers per square yard, 10 acres worth of the hungry insects would be eating about as much as one cow.

That's not even a severe infestation. Boxler says the threshold at which he recommends applying control measures is 15 adult grasshoppers per square yard. It's the adults that cause the damage, but little ones grow into big ones. Well, about half of them survive to adulthood. So, if the estimated population of immature hoppers (nymphs) is 25 to 30 per square yard, treatment is advised. Control measures are most effective against immature hoppers. Controlling adults can be difficult.

Boxler says grasshoppers produce one generation per year. The eggs deposited just under the soil surface in late summer and fall normally hatch during the following spring. The weather and its effect on soil temperature is a big factor influencing when young hoppers emerge and their rate of survival.

"In Nebraska, for example, eggs usually hatch in early- to mid-May. But weird things happen. Back in 2003, we were seeing outbreaks of hoppers in the canyons of some Nebraska counties by late March. In some years, they don't appear until June," tells Boxler.

Feeding & Feedstuffs

Grasshoppers generally flourish when temperatures are above normal and precipitation is below normal. Outbreaks are usually preceded by several years of hot, dry summers and warm falls, allowing populations to increase slowly. Spring soil temperatures of 50° to 55° F are most favorable for the hatching of eggs, but Boxler says a successful hatch doesn't necessarily yield a large population of adults. When a period of cool, wet weather follows emergence of nymphs, their numbers may be significantly reduced.

"Nymphs are vulnerable to cool, wet spring weather, especially during the first instar (stage of development). A nymph has food reserves for only one day. Under cool, wet conditions it doesn't move around and eat, so it starves," Boxler explains, adding that natural enemies of grasshoppers — parasitic bacteria, fungi and protozoa — also do their best work when it's cool and wet.

Boxler says grasshoppers lay eggs in clusters or pods that may contain up to about 100 eggs. A female will produce eight to 30 pods. Newly hatched nymphs are much smaller, wingless versions of the adults, and go through a series of growth stages. The time period between the hatch and adult is 40-60 days.

As winged adults, grasshoppers can live two to three months and are highly mobile. Their diets vary by species, with some feeding on grasses while others prefer forbs. Some species enjoy a mixed diet.

Boxler emphasizes that chemical control of grasshoppers is most effective when applied before grasshoppers reach the adult stage. It's often most economical to concentrate control efforts on areas of heavy infestation and high-value acreage. For rangeland and pastures, he suggests consideration of the Reduced Agent and Area Treatment (RAAT) approach. This method incorporates a relatively low chemical application rate with swath or strip spraying, as opposed to blanketing all of the infested acreage.

Hoppers move about 10 feet per day and will move into treated areas where the chemical's residual effect gets them. Also, hoppers are cannibalistic and will die after consuming other dead hoppers," Boxler says. "The advantages of the RAAT approach are that it can lower treatment costs by 50% to 60%, and it reduces the impact on 'good guy' insects."

Producers are advised to contact Extension personnel for help in choosing an appropriate pesticide. Chemicals with longer residual effects are best for RAAT applications. Care should be taken as some chemicals should not be used while cattle occupy a pasture, and some products are labeled for cropland only.

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### Lilac as grasshopper gauge

Using plants as indicators of some coming event is nothing new to agricultural producers. One of the most well-known is the appearance of goldenrod blooms as a predictor of the fall's first frost.

A plant portent that seems to bear up under scientific scrutiny is the blooming of the common lilac as an indicator of when the grasshopper hatch is under way. Knowing when to start monitoring grasshopper populations can help land managers decide whether control measures are warranted. For optimum results, treatments should be applied while grasshoppers are immature and most susceptible.

According to North Dakota State University Cooperative Extension reports, the main variable affecting bloom time of the lilac is temperature, which is also the primary factor influencing grasshopper hatch. Research suggests that, on average, 75% of grasshoppers will be first-stage nymphs and 25% will be in the second stage by 10 days after your lilacs start to flower. Local variation occurs because of temperature differences due to elevation, and grasshopper hatching and development may be somewhat earlier on south-facing slopes.