



# CROPS

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## Grasshoppers in Field Crops

no. 5.535

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### Quick Facts...

Grasshoppers often appear first in weedy areas of roadsides, fence rows, irrigation ditches and other noncrop areas.

After these food plants are gone, the insects leave in search of other food, often an irrigated crop or newly emerged winter wheat.

Control grasshoppers in the weedy areas with low rates of insecticides. Once they reach field margins, they may be larger and require higher rates of insecticides for control.

Two options are available to farmers once it has been determined that crops are threatened: poison baits, and foliar or soil insecticides.

Grasshoppers are one of the most important insect pests in Colorado. They follow a roughly 22-year cycle in Colorado. The last major outbreak was in the late 1970s and early 1980s. Some problems occur even in years of low numbers. Although they are most important on rangeland, they also attack field crops, often with economic losses to the farmer. An exception is sorghum, which usually is not fed upon once it has reached about 10 inches in height.

Grasshoppers lay eggs in undisturbed areas, usually in late summer and early fall. Small nymphs or “hoppers” hatch the following spring. Winged adults appear five to six weeks after hatch. Eggs of a few Colorado species hatch in late summer and pass the winter as nymphs. Winged adults of these species usually appear early in the following summer, often causing undue alarm about unusually early grasshopper activity. Some of these early-season species are important on rangeland, but none are considered a threat to field crops. Most field crop damage is caused by the differential, redlegged, two-striped and migratory grasshoppers, all species that follow the typical grasshopper life cycle.

### Control of Grasshoppers

The usual pattern of grasshopper damage in field crops is for early development to occur in weedy areas of roadsides, fence rows, irrigation ditches and other noncrop areas. As these food plants are eaten or dry down, the grasshoppers leave in search of other food, often an irrigated crop or newly-emerged winter wheat. Here they first feed in the field margins and then, conditions permitting, spread throughout the field.

Grasshoppers become more difficult and expensive to control as this pattern develops. Grasshoppers in the weedy areas are concentrated in a small area. They can therefore be controlled with low rates of insecticides applied to a relatively few acres. Once they reach the field margins, they may be larger and require higher insecticide rates for good control, although the acreages involved will still be small. After they spread throughout a field, high insecticide rates applied to larger acreages are required to protect the crop.

Table 1 gives information useful in deciding if a grasshopper population is enough of a threat to a crop to justify spending money on an insecticide treatment. Modify these general guidelines according to grasshopper species, crop conditions, and crop value. For example, use lower counts for a valuable crop such as pinto beans and higher counts for a lower value crop such as proso millet. Walk through the field and count the grasshoppers that jump or move within a square foot area. Take 18 counts per field and then divide the total by two to get grasshoppers per square yard. Consider treatments when the average count reaches the threatening level.

Two options are available to farmers once it has been decided that crops are threatened: poison baits and foliar or soil insecticides.

**Colorado  
State**  
University

**Extension**

The following websites provide a large amount of information on the biology, identification and management of grasshoppers in the West.

[www.sdvc.uwyo.edu/grasshopper/ghwywfrm.htm](http://www.sdvc.uwyo.edu/grasshopper/ghwywfrm.htm)

[www.sidney.ars.usda.gov/grasshopper/](http://www.sidney.ars.usda.gov/grasshopper/)

## Poison Baits

The main advantage to poison baits is that they can be applied to crops or weedy areas in which the plants are too small for good insecticide spray coverage, such as newly-cut alfalfa or weeds that have dried or been eaten down. Under other conditions, insecticide sprays are cheaper and more effective.

Carbaryl insecticide-impregnated bran bait is available as a 2 or 5 percent formulation. This method can provide good control when applied just before winter wheat emergence, when crop plants are only a few inches tall, or in areas with short, dry vegetation. The keys to success are uniform distribution of bait and reapplication if the bait is no longer attractive to grasshoppers. Attractiveness of the bait is reduced substantially by moisture (rain or heavy dew).

*Nosema locustae*, a disease organism that attacks many grasshopper species, is also available in bait form. This disease can reduce grasshopper populations over a period of several years, but *Nosema* baits will not protect a crop during the same growing season in which it is applied. *Nosema* baits may be effective when applied early in the season against small nymphs, but there are no data showing their effectiveness in protecting field crops.

## Foliar Insecticides

Foliar insecticides are the treatment of choice in most situations. The *High Plains Integrated Pest Management Guide*, [www.highplainsimp.org](http://www.highplainsimp.org), lists the insecticides currently approved for control of grasshoppers on Colorado field crops and noncrop areas that serve as infestation sources. These registrations are subject to change, so check the current label. Be sure to follow all label instructions and precautions.

Table 1: Treatment guidelines based on number of grasshoppers (nymphs and adults) per square yard for crops other than winter wheat.

Grasshopper Population	Field	Field Margin	Treatment necessary?
Non-economic	0-2	5-10	No
Light	3-7	11-20	Questionable, depends on size, species, type of crop
Moderate	8-14	20-40	Probably
Abundant	15+	41+	Yes

## Winter Wheat

Grasshoppers pose a significant threat to emerging winter wheat because the plants are small and the grasshoppers are adults. Light to moderate infestations, as defined in Table 3, can cause stand reductions in field margins. Treatments can be limited to field borders. Spring infestations have the potential to clip heads, as summarized in Table 2.

Options for controlling low to moderate infestations include foliar insecticides applied **just prior to crop emergence** or seed treatments. (See the High Plains Integrated Pest Management Guide ([www.highplainsimp.org/](http://www.highplainsimp.org/)), for details. **Be sure to read, understand and follow all label instructions.** If grasshopper infestations are high, consider doubling the seeding rate for the outer one or two passes.

Table 2: Spring treatment guidelines for immature and adult grasshoppers in winter wheat (modified from University of Minnesota information).

Rating <sup>a</sup>	Nymphs/yd <sup>2</sup>		Treat?	Adults/yd <sup>2</sup>		
	Adjacent	Crop		Adjacent	Crop	Treat
Light	25-35	15-25	No	10-20	3-7	Yes, if there is potential for head clipping.
Threatening	50-75	30-45	Depends on prices, crop condition	21-40	8-14	Yes, if there is potential for head clipping.
Severe	100+	60+	Yes, monitor for retreatment	41+	15+	Yes, consider wider border treatments and monitor for treatment.

<sup>a</sup>This is a general rating used in all crops.

Table 3: Fall treatment guidelines for adult grasshoppers in winter wheat (modified from University of Minnesota information).

Rating <sup>a</sup>	Adults/yd <sup>2</sup>		Treat
	Adjacent	Crop	
Medium	10-20	3-7	Yes
Threatening	21-40	8-14	Yes, consider wider border treatments
Severe	41+	15+	Yes, use wider border treatments and monitor for retreatment.

<sup>a</sup>This is a general rating used in all crops.