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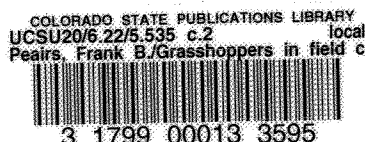
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# Grasshoppers in field crops

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## Quick Facts

Grasshoppers usually 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.

Grasshoppers in the weedy areas can be controlled with low rates of insecticides; once they reach the field margins, they may be larger in size 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, or foliar or soil insecticides.

Grasshoppers are one of the most important groups of insect pests in Colorado. Although they are most important on rangeland, field crops are attacked, 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. Two useful references are available for those interested in learning more about Colorado grasshoppers: *Grasshoppers in Colorado*, CSU Extension Bulletin 502A; and *Grasshoppers (Acrididae) of Colorado: Identification, Biology and Management*, CSU Experiment Station Bulletin 584S.

## 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 will first feed in the field margins and then, conditions permitting, spread throughout the field. Grasshoppers will become more difficult and more expensive to control as this pattern develops. Grasshoppers in the weedy areas will be 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 in size and require higher insecticide rates for good control, although the acreages will still be small. Once they have spread throughout a field, high insecticide rates applied to larger acreages will be required to protect the crop.

An additional advantage to early control of grasshoppers is that such measures will have an effect on the next year's population. If grasshoppers in an area are reduced to less than one per square yard before they have a chance to lay eggs, it will be several years before they again reach levels high enough to threaten crops. 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.

**Table 1: Damage potential of grasshoppers to field crops.**

Classification	Grasshoppers per square yard		
	Field	margins	Treatment?
Non-economic Light	0-2	1-10	Usually not
	3-7	11-20	Perhaps (depends on size and species of insect, stage and value of crop)
Moderate Heavy	8-14	21-40	Usually
	14	40	Yes

Two options are available to farmers once it has been decided that crops are threatened:

- poison baits
- foliar or soil insecticides

## 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 have been eaten down. Under other conditions, insecticide sprays are cheaper and more effective.

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A new use for baits is the application of *Nosema locustae*, which is a disease organism that attacks many grasshopper species. Recent information indicates that 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.

Poison grasshopper baits may be purchased commercially or formulated by the farmer. Both have carbaryl (several formulations of Sevin) as their active ingredient. There are a number of recipes for grasshopper baits. The following will yield enough bait to treat approximately 1-1.5 acres.

2 pounds Sevin 80S or 1.5 quarts Sevimol  
1.75 gallons of water  
0.5 gallon molasses (0.25 gallon with Sevimol)

Mix the above together and spray onto 25 pounds of bran, wheat middlings, or equal parts of wheat middlings and sawdust, while the dry mixture is being tumbled in a concrete mixer or similar device. The resulting mixture or one of the commercial baits may be applied with an endgate

spreader. Use the heavier rate (treat just one acre with the above recipe) if the grasshoppers are large. The application may have to be repeated if there is heavy feeding on the bait.

## Foliar and Soil Insecticides

Foliar insecticides are the treatment of choice in most situations. Table 2 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 the current label should be checked. Be sure to follow all label directions and precautions.

Systemic soil insecticides can be applied to winter wheat at planting time, if adequate soil moisture is available to mobilize the chemical so it can be taken up by the plant. Since most grasshopper feeding will be in the field margins, treating the outer two to three drill rounds should protect the entire field. Currently, Thimet 20G and Disyston 15G are registered for this use. These insecticides should be placed in a grass seeder attachment, not mixed with the seed, and applied according to label instructions.

**Table 2: Insecticides registered for grasshopper control in field crops.**

	Alfalfa*	Beans	Corn	Potatoes	Sugar beets	Winter wheat small grains	Noncrop area**
Acephate (Orthene 75S)		1/4-1/2 (14)				1/4 (see state label)	1/10-1/8
Azinphosmethyl (Guthion 2L, 2S) R	1/2-3/4 (16, 21)						
Carbaryl (Sevin XLR, 80S, Sevimol)	1/2-1 1/2 (0)		1/2-1 1/2 (0)	1/2-1 1/2 (0)	1/2-1 1/2 (14)	1/2-1 1/2 (21-grain)	1/2-1 1/2
Carbofuran (Furadan 4F) R	1/8-1/4 (7)		1/8-1/4 (30)			1/8-1/4 (before heading)	
Chlorpyrifos (Lorsban 4E)	1/4-1/2 (14)		1/4-1/2 (35)				
Diazinon (D Z N AG500)	1/2 (7)		1/2 (0)		1/2 (0)		3/8-1/2
Dimethoate (Cygon 400)	1/4-1/2 (10)	1/4-1/2 (0)	1/2 (14)	1/4-1/2 (0)		3/8-wheat only (60 days-grain)	
Ethyl Parathion R	1/4-1/2 (15)		1/4-1/2 (12)	1/4-1/2 (15)	1/2 (15)	1/2 (15)	
Fenvalerate (Pydrin 2.4E) R			1/10-2/10 (21)				
Malathion (57EC, 8EC) R	1-1 1/2 (0)				1-2 (3)		3/4-1 1/2
Malathion ULV	8 fl. oz. (0)		8 fl. oz. (5)		8 fl. oz. (0)	8 fl. oz. (7)	8 fl. oz.
Methyl Parathion R	1/4-1/2 (15)		1/2 (12)		1/4-3/8 (20)	3/8-1/2 (15)	
Methyl Parathion (PennCap M) R	1/4-3/4 (15)		1/4-3/4 (12)	1/4-3/4 (15)		1/4-3/4 (15)	1/2-1 1/2
Mevinphos (Phosdrin 4E) R	1/4-1/2 (1)	1/4-1/2 (1)		1/4 (1)			

\*Unless otherwise indicated, the first set of numbers is the pounds of active ingredient to be applied per acre, while the number in parentheses is the minimum waiting period between application and harvest.

\*\*See label for grazing and hay restrictions.

R = Restricted use insecticide.