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## Grasshopper Control

Cooperative Extension South Dakota State University

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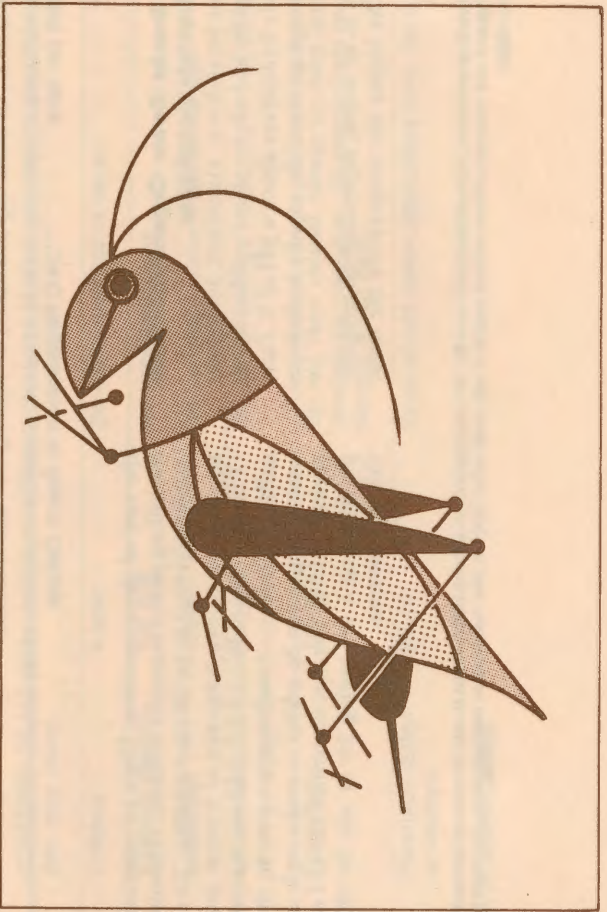
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# grasshopper control



Cooperative Extension Service  
South Dakota State University  
U. S. Department of Agriculture

# grasshopper control

by B. H. Kantack, Extension entomologist, and W. L. Berndt,  
Extension pesticide specialist

## GRASSHOPPER PROBLEMS

Grasshoppers are usually prevalent in some areas of South Dakota each year. Heavy outbreaks also are likely to occur periodically where extensive acreages are infested over a wide area.

Severe infestations occur during seasons where hot and dry weather conditions prevail. Farmers and ranchers should watch for grasshoppers early in the season and initiate control measures immediately where problems exist.

## APPLY CONTROL MEASURES EARLY

Two general groups of injurious grasshoppers are of economic importance in South Dakota. Species of economic importance are usually grouped into cropland and rangeland grasshoppers.

The best time to control grasshoppers is when they are small and before they migrate into cropland areas. Apply insecticides shortly after the main egg hatch is completed. There are a number of advantages in this early treatment: (1) fewer acres will have to be treated and less insecticide is necessary to obtain control; (2) injurious grasshopper species are killed before they have had the opportunity to injure the crops; (3) early treatments before the grasshoppers have reached maturity prevent egg deposition which helps reduce the potential grasshopper threat for the following crop year.

Number of Grasshopper Adults Per Square Yard

Field	Margin	Infestation or damage category
0-2	5-10	non-economic
3-7	11-20	light
8-14	21-40	moderate to abundant
15-28	41-80	threatening to severe
over 28	over 80	very severe

The above table applies both to infestations in cropland and rangeland. Insecticide control is advised when the infestation reaches threatening levels.

## TREATING GRASSHOPPER INFESTATIONS IN DIFFERENT SITUATIONS

**Cropland (Small Grains, etc.).** Fall and spring tillage of the soil helps reduce grasshopper populations. Inspect all grain fields periodically and treat only areas where grasshoppers are found. Field margins and headlands are areas where young grasshop-

pers are usually present. In South Dakota, winter wheat fields are often severely damaged each fall; border spraying of these fields can prevent considerable damage.

**Legume Fields.** Usually the entire field is infested and must be sprayed to obtain adequate control. Since some grasshopper species hatch later, the main hatch will not be completed until after the first crop of hay has been harvested. Delay spraying until the second crop is about 3 inches tall in legume fields. Sometimes growers leave a small trap strip from the first cutting to attract grasshoppers from the remainder of the field. This strip is then sprayed with a suitable insecticide.

**Conservation Reserve (Soilbank).** In fields where forage crop cover is lacking and weeds are prevalent, the entire field will often be infested with grasshoppers. In fields where grass growth is good, the grasshoppers will usually be concentrated along the margins and borders of the field. Under dry conditions considerable migration from these soilbank areas into adjacent crops usually occurs.

**Roadside.** Fence rows and roadsides are favorite oviposition sites for grasshoppers. Often a properly timed spray in these areas after the main grasshopper hatch will eliminate the need for a costly spray on adjacent cropland. Spray these areas before the grasshoppers begin migrating into adjacent cropland.

**Pastureland.** Grasshopper problems often arise in pastures that have been overgrazed or mismanaged. Heavy infestations in pastures result in considerable loss of grass and grazing capacity. Grasshoppers from pasture areas often invade adjacent field crops later in the season.

Proper pasture management and improvement methods will discourage grasshopper populations. When insecticides are needed for control of grasshoppers in pastures, it is very important that the proper insecticide is selected so that grazing is permitted either immediately or soon after application.

**Rangeland.** In rangeland areas, grasshopper problems frequently arise. A severe rangeland infestation can reduce the grass growth so that the carrying capacity of livestock is greatly lowered. For lands under federal domain, the responsible agency treats the infested areas when the situation warrants control measures.

## Insecticides recommended and precautions for proper use for grasshopper control on various crops.

Crop	Insecticide	Dosage*	Remarks, precautions
Small grain	Toxaphene	1½-2 lb/A	Do not feed treated forage to dairy animals or animals being finished for slaughter. No limitation on use of grain.
	Ethyl Parathion	8 oz/A	Experienced aerial applicators only. Do not harvest for 15 days.
	Pennacap-M	8 oz/A	Do not harvest for 15 days.
	Malathion	1 lb/A	Do not harvest for 7 days.
Winter wheat (field borders)	Thimet 15G	1 lb/A (based on 7 inch spacings)	Apply at planting time in seed furrow with granular applicator or grass seeder attachment. Do not graze treated wheat for 45 days.
	**DiSyston 15G	1 lb/A (based on 7 inch spacings)	Apply at planting time in seed furrow with granular applicator or grass seeder attachment. Do not graze treated wheat for 30 days.
	Furadan	4 oz	Follow label precautions.
	Orthene	3/16 lb actual/A	Do not pasture or feed treated hay within 21 days.
Corn	**Furadan	4 oz/A	Do not harvest for 30 days.
	Dimethoate (Cygon-De-Fend)	8 oz/A	Do not harvest for 14 days.
	Toxaphene	1½-2 lb/A	Do not feed treated forage to dairy cattle or animals being finished for slaughter. No limitation on use of grain.
	Pennacap-M	8 oz/A	Do not harvest for 12 days.
	Carbaryl (Sevin)	1½-2 lb/A	No time limitation.
	Lorsban	4-8 oz/A	Do not harvest for 50 days. Follow other label limitations.
	Ethyl Parathion	8 oz/A	Experienced aerial applicators only. Do not harvest for 12 days.
	Malathion (ultra low- volume concentrate)	8 fl oz/A	Aerial applicators only. Do not harvest for 5 days.
	Malathion	1 lb/A	Do not harvest for 5 days.
Sorghum	Dimethoate (Cygon-De-Fend)	4 oz/A	Do not harvest or graze within 28 days.
	Carbaryl (Sevin)	1½ lb/A	No time limitation on corn or sorghum grown for forage. Do not apply on sorghum grown for grain within 21 days of harvest.
	Toxaphene (grain sorghum only)	1½ lb/A	Do not graze toxaphene-treated forage with dairy animals or animals being finished for slaughter. Do not ensile treated forage. Do not apply more than once after heads start to form. Do not harvest within 28 days.
	Ethyl Parathion	8 oz/A	Experienced aerial applicators only. Do not harvest for 12 days.
	<b>(CAUTION: Do not spray methyl parathion or mixtures of ethyl and methyl parathion on sorghum as plant injury may occur.</b>		
Soybeans	Orthene	4 oz/A	Do not harvest for 14 days.
	Carbaryl (Sevin)	1½ lb/A	No time limitations.
	Malathion	1 lb/A	Do not apply within 1 day of harvest.
	Malathion (ultra low- volume concentrate)	8 fl oz/A	Do not harvest for 7 days.
	Toxaphene	1½ lb/A	Do not feed treated forage to dairy animals or animals being finished for slaughter. No restrictions on threshed beans. Do not harvest for 21 days.
	Parathion (Ethyl or Methyl)	8 oz/A	Experienced aerial applicators only. Do not harvest for 15 days.

\*\*24-C Registration in South Dakota.

Crop	Insecticide	Dosage*	Remarks, precautions
Alfalfa, clover-forage and seed	Furadan	4 oz/A	Do not harvest for 7 days.
	Dimethoate (Cygon - De-Fend)	4 oz/A	Do not apply more than once per season or within 10 days of harvest.
	Carbaryl (Sevin)	1½ lb/A	No time limitations.
	Malathion	1 lb/A	No time limitations.
	Parathion (Ethyl or Methyl)	8 oz/A	Experienced aerial applicators only. Do not apply within 15 days of harvest.
	Diazinon	1 lb/A	Do not graze livestock within 2 days or cut hay within 10 days of application. Do not spray alfalfa in bloom.
	Malathion (ultra low-volume concentrate)	8 fl oz/A	No waiting period. Do not spray alfalfa or clover in bloom.

Malathion ultra low-volume concentrate is not recommended for grasshopper control after alfalfa is over 8 inches tall or where very dense foliage is present. Where dense foliage is encountered and malathion is being used, a 5- to 6-foot boom height with a 50-foot swath width is recommended.

**To protect bee population, spray before 7 a.m. or after 7 p.m. Never spray alfalfa in bloom. Notify local beekeepers before spraying.**

Sunflowers (use border sprays whenever possible)	Toxaphene	2 lb/A	Do not feed treated foliage to dairy animals or animals being finished for slaughter.
	Parathion (Ethyl or Methyl)	8 oz/A	Experienced aerial applicators only. Do not apply within 30 days of harvest.
	Carbaryl (Sevin)	As labeled	As labeled
Pastures and ranges, roadsides, field margins, ditches and other lands	**Orthene	2-3 oz/A	Do not apply when lactating dairy cattle are present. Do not pasture or feed hay to dairy cattle within 21 days of application. Remove meat animals from treated areas at least 7 days before slaughter if they were present at application or grazed treated areas within 21 days after application.
	Malathion	1 lb/A	No time limitation. Dairy cattle must be removed from the pasture during application of the sprays.
	Malathion (ultra low-volume concentrate)	8 fl oz/A	Aerial applicators only. May be harvested or grazed on day of application.
	Pennacp-M	8 oz/A	Do not harvest or graze for 15 days.
	Carbaryl (Sevin)	1½ lb/A	No time limitation.
	Carbaryl (Sevin-oil)	1-1½ lb/A	No time limitation.

(CAUTION: All dairy animals must be removed from areas being treated with malathion or Sevin but can be turned into areas after spraying operation is completed. Avoid applying insecticides near streams, farm ponds, etc., to avoid any possibility of injuring fish and wildlife.)

\*In terms of actual toxicant per acre

\*\*24-C Registration in South Dakota

### Hard Water Rapidly Breaks Down Organophosphate and Carbamate Insecticides

A few examples of this breakdown: malathion, an organic phosphate insecticide, rapidly hydrolyzes above a pH of 7; and Sevin, a carbamate, rapidly hydrolyzes above a pH of 9. Parathion, another organic phosphate insecticide, rapidly hydrolyzes above a pH of 9.

The rate of hydrolysis is, of course, dependent on temperature and other factors. The higher the temperature the faster

the rate of decomposition. Once an insecticide breaks down, the killing power is usually reduced. Hydrolysis often occurs in a very short time in an alkaline solution. To counteract alkalinity, add one to two teaspoons of vinegar per gallon of water. (Example: for pH of 7.5-8.0, add one teaspoon of vinegar per gallon.) Unsoftened well water varies in the degree of hardness. Vinegar can be added to make such water slightly acid (below pH 7). You can determine the pH of your water supply by using a soil testing kit or ask the city department for this information.

### Precautions

Select the insecticide to fit the situation. Always follow the label and use recommended rates. Pay particular attention to the waiting periods required between the

time of application and harvest or grazing of the treated areas. Never apply an unlabeled insecticide or allow an unlabeled insecticide to be applied on your crop. Always read and understand the label.

**Use of a trade name does not indicate endorsement of one product over another.**

## South Dakota Poison Control Centers

### Sioux Falls:

(treatment and information)

Poison Control Center  
McKenna Hospital  
800 East 21st Street  
Sioux Falls, South Dakota 57101  
Phone: 605-336-3894,  
G.F. Touhy, M.D.

### Aberdeen:

St. Luke's Hospital  
305 South State Street  
Aberdeen, South Dakota 57401  
Phone: 605-225-5110

### POISINDEX

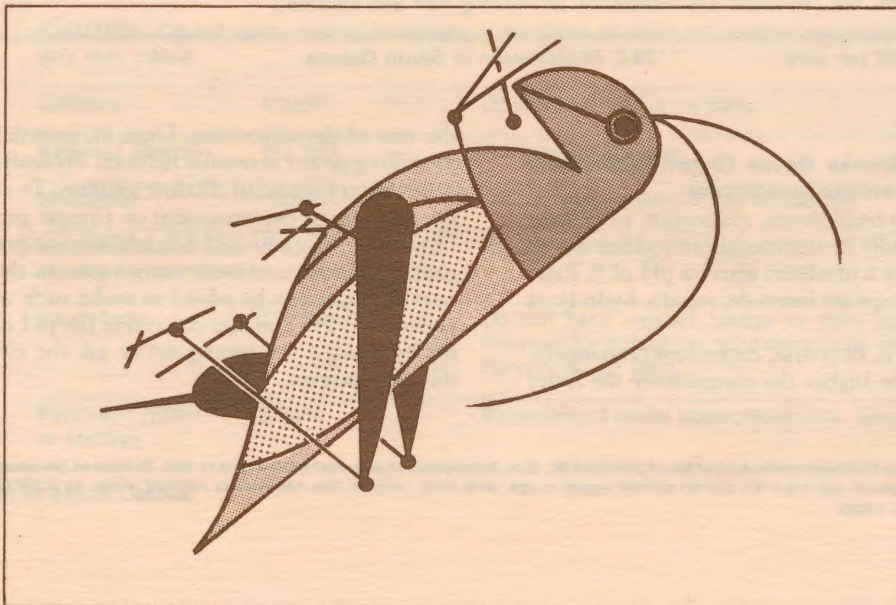
Rocky Mountain  
Poison Control Center  
West 8th Avenue and Cherokee  
Denver, Colorado  
Phone: 1-303-893-7771

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