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EC95-1561-D Insect Management Guide for Nebraska Sugarbeets, Dry Beans, Sunflowers, Vetch, Potatoes, and Onions

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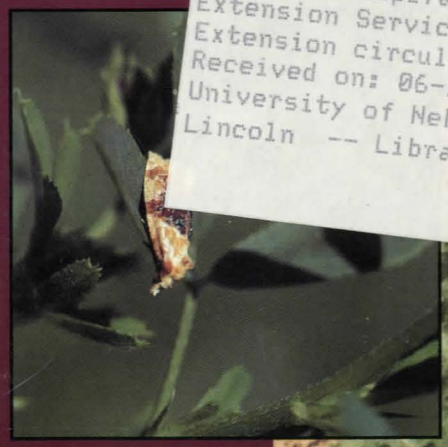
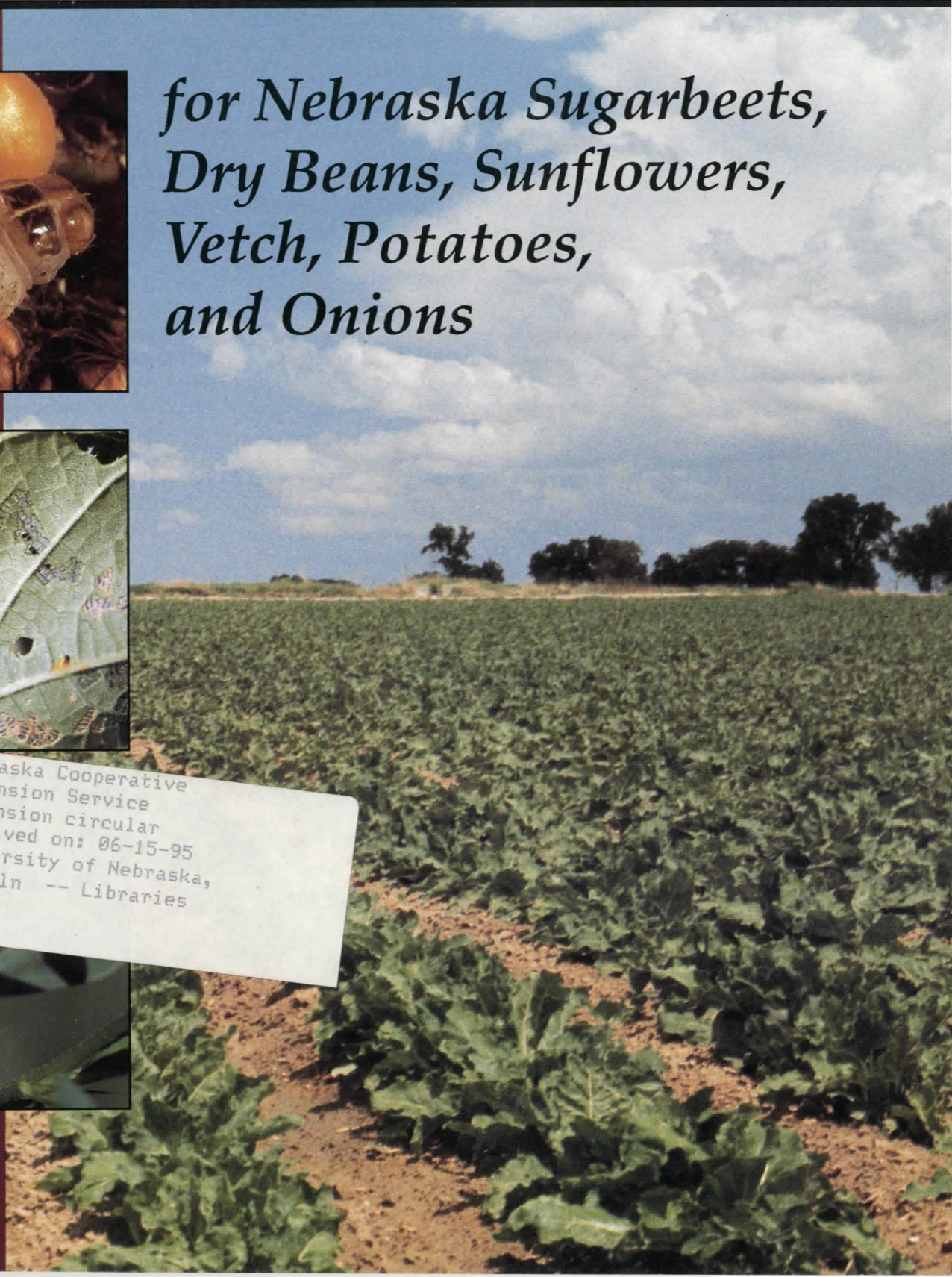
INSECT MANAGEMENT GUIDE

for Nebraska Sugarbeets, Dry Beans, Sunflowers, Vetch, Potatoes, and Onions





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Insect Management Guide for Nebraska Sugarbeets, Dry Beans, Sunflowers, Vetch, Potatoes, and Onions

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Index

Abbreviations 3
Container disposal 3
Dry bean insects 9
  Mexican bean beetle 9
  Seedcorn maggots 10
  Thrips 10
  Western bean cutworm 9
Grasshoppers 16
Honeybees, protecting 2
Crop Watch Newsletter
  Description 1
  Order form 25
Insecticides
  Field re-entry times 4
  Performance 2
  Preharvest interval 4
  Restricted use 1
  Sprayed by mistake? 3
  Toxicity 1
Management decisions/guidelines
  economic thresholds 1
Onion insects 23
  Cutworms 23
  Onion maggots 23
  Onion thrips 23
Potato insects 17
  Aphids 19
  Colorado potato beetles 19
  Cutworms 19
  European corn borers 19
  Flea beetles 17
  Wireworms 18
Seed treatments 2
Sugarbeet insects 5
  Cutworms 6
  Root aphids 6
  Root maggots 5
  Wireworms 6
Sunflower insects 13
  Cutworms 14
  Grasshoppers 16
  Head-clipper weevils 14
  Seed weevils 14
  Stem weevil 14
  Sunflower beetle 14
  Sunflower moths 13
Vetch insects 17
Who to call 3

On the cover

Insect pests pictured from top to bottom are the western bean cutworm, the Mexican bean beetle, and the banded sunflower moth.

General guidelines

Insect management suggestions in this circular are based on University of Nebraska research, data from surrounding states, USDA recommendations, previous experience, and label registrations. These suggestions are designed to guide Nebraska farmers when they select an insect management program. Extension NebGuides and other publications containing additional information on insect identification, damage, and life cycles are referenced under insect headings and are available by mail order or from local Cooperative Extension Offices. (For more information write: Bulletins, 105 ACB, P.O. Box 830918, University of Nebraska, Lincoln, NE 68583-0918.)

This publication does not supersede label information. Always read and carefully follow the instructions on the container label. The user is responsible for the effects of pesticide residues on crops and livestock, as well as pesticide drift and contamination. For current information, contact your local Cooperative Extension Office.

The use of trade names in this circular is not an endorsement by Nebraska Cooperative Extension.

Toxicity of insecticides

All insecticides are poisonous and must be used with caution. Always store them in their original containers out of the reach of children, unauthorized personnel, and livestock. A skull and crossbones and the words ***Danger/Poison*** appear in red on the label of highly toxic materials and require special handling. Liquid formulations of these products are recommended only for use by commercial applicators. Granular formulations of these chemicals can be applied safely and effectively when proper precautions are followed as indicated on the label. Moderate and low toxicity pesticides are marked with the signal words ***Warning*** and ***Caution,*** respectively.

For more information on this subject, refer to Extension NebGuides: *Protective Clothing and Equipment for Pesticide Applicators, G85-758; Signs and Symptoms of Pesticide Poisoning, G84-715; Farm Pesticide Storage, G79-460; Disposal of Pesticides Containers, G79-472; Disposal of Excess Pesticides and Related Waste, G79-473,* and *Pesticide Laws and Regulations, G79-479.*

(R) Restricted Use (R)

Several insecticides listed in this circular are classified ***Restricted Use*** by the Environmental Protection Agency. These compounds are marked with the symbol **(R)**. Pesticides may be classified as ***Restricted Use*** based on their persistence, toxicity, or potential environmental hazards. To use these products, EPA certification is required. A valid certification card must be presented to your dealer when buying these chemicals.

Your local Cooperative Extension office will have a list of the dates and locations of certification training. Remember that the status of a formulation can change at any time. When buying a pesticide, ask the dealer if the attached label is current.

Important

Subscribe to the University of Nebraska-Lincoln ***Crop Watch Newsletter*** for the latest

Integrated pest management (IPM) should be the basis for all management decisions regarding pests. IPM is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health and environmental risks. IPM is much more than simply management of pesticides, and pesticides should in fact be considered the last resort for reducing losses due to pests in most cases.

It is essential to balance all risks in the process of developing an IPM program. Economic risks should be minimized through the utilization of preventative practices, approved pest scouting techniques and by implementation of economic thresholds to make pest management decisions. Minimize health risks by following all safety directions on pesticide labels. Minimize environmental risks by avoiding pesticide use when possible, selecting the most appropriate pesticide for each situation, and by following all environmental or wildlife safety guidelines on the pesticide label.

pest management and crop production information, changes in pesticide registrations, and updates on the current status of insect pests. An order blank is on page 25.

Management decision guidelines/ economic thresholds

Economic thresholds are flexible guidelines. They indicate the level of insect abundance or damage that can be tolerated before taking action. **They are not hard rules that apply to every situation.** Used conscientiously, they should be helpful in making management decisions. Many variables can affect your decision including insect abundance, anticipated value, relative effectiveness of controls, and costs for the pesticide and application. Timing and accuracy of application, as well as the effects of weather, also determine the ultimate degree of control.

Seed treatments

Damage to seed by soil-dwelling, seed-feeding insects is often intensified by prolonged periods of cool, moist weather after planting or other conditions which delay germination. In Nebraska, the major seed-feeding insects are wireworms, seedcorn maggots and seedcorn beetles. Once planted, little can be done to protect seed from these insects. Probably the most effective way of reducing injury by seed-feeding insects is with an approved planter-box seed treatment containing lindane prior to planting. **These treatments are suggested for all field crops in Nebraska.** In fields with a history of serious seed-feeding insect problems or in situations where stands have been seriously reduced and replanting is the only feasible recourse, consider a seed treatment plus an in-furrow application with an approved soil insecticide. Planting time insecticides should not be placed in-furrow on sugarbeets. *(For more information on seed treatments, refer to Extension NebGuide G91-1023.)*

NOTE: Agricultural seed is often treated with an insecticide such as malathion to protect against damage from stored grain pests. These treatments will **not** provide protection against seed-feeding soil insects.

Insecticide performance

When pest problems exist or are anticipated, select an appropriate management strategy. If pesticides are indicated:

1) Select the proper insecticide/miticide.
2) Read, understand, and follow label directions.
3) Calibrate application equipment for each use.
4) Document application rates and keep accurate records.
5) Leave untreated check strips.
6) Continue regular scouting to determine pest abundance and to evaluate product performance.

Insecticides can provide less than satisfactory control for a variety of reasons, including: 1) unusually high insect infestations, 2) inaccurate calibration, 3) improper placement and incorporation, 4) poor timing, 5) inappropriate product selection (low toxicity to target pest), 6) high soil or water pH, 7) pest resistance to insecticide, 8) enhanced microbial breakdown, 9) weather factors (excess rain, wind, drought, temperature), and 10) other environmental conditions.

If you suspect a problem with insecticide performance:

1) Compare treated areas of field to untreated check strips.
2) Reread product label for warranties, guarantees, and claims.
3) Consult an Extension agent or other pest management specialist and, if appropriate, contact your pesticide dealer and/or pesticide company representative as soon as possible.
4) Be prepared to document suspected loss.

When one product fails in a field while another product provides control, the manufacturer may have a responsibility to the grower. This could include replacement of the product, and/or compensation for lost yield.

Protect honeybees

Honeybees collect nectar and/or pollen wherever they can, including field crops such as corn, sorghum, soybeans, sunflowers and alfalfa. If bee colonies are nearby or bees are foraging in fields sprayed during flowering (pollen-shed stage for corn and sorghum), they may be killed in substantial numbers.

To avoid injury to important pollinators observe the following precautions: 1) treat only if insect pests reach economic levels; 2) if possible, do not treat crops that are in bloom; 3) never directly spray honeybee

colonies; 4) check the crop for heavy concentrations of flowering weeds and avoid spraying these areas; 5) treat only those parts of fields that have significant pest infestations; 6) when possible, select an insecticide that has a lower toxicity to bees; 7) make applications very early in the morning or later in the evening when bees are not actively foraging; and 8) properly dispose of unused pesticides.

Beekeepers often will relocate bees from areas to be treated if given sufficient prior notice.

Sprayed by mistake?

Gardens, particularly plantings of sweet corn, often are placed in or adjacent to crop fields that may be sprayed with an insecticide. The produce is safe to eat if the insecticide is registered for use on the vegetable or fruit and the specified waiting period has elapsed.

We do not suggest using vegetables or fruit that have been treated with a pesticide which is not labeled for that commodity. The table on page 4 shows some selected preharvest intervals (waiting periods). Check appropriate labels for any others.

If you have questions regarding accidental applications, determine the specific pesticide formulation used, the application rate, and time of spraying. Then, by checking the pesticide label, an informed decision can be made concerning use of the crop.

Container disposal

Proper disposal of insecticide containers is important. Serious accidents have occurred when "empty" containers have not been disposed of safely. Following are suggested disposal methods:

Paper bags: Be certain all contents have been emptied into applicators or tanks. Burn paper containers in open fields where: 1) regard is given to wind direction in relation to people, domestic animals, and water supplies; 2) such burning does not violate federal, state or local ordinances; and 3) provisions are made to avoid contamination of surface water.

Metal, glass, or plastic containers: Thoroughly rinse containers at least three times with water and dump rinse material into tanks to be used with regular applications. Where possible, recycle metal and plastic containers after completely rinsing. Containers that cannot be recycled should be punctured, crushed, and buried in a landfill or 24 inches below the soil surface where they will not contaminate water, crops, man, or animals.

Abbreviations

AI/A — Active ingredient per acre
E — Emulsifiable
EC — Emulsifiable concentrate
ES — Emulsifiable suspension
F — Flowable
Form — Formulation
G — Granular
GPA — Gallons per acre
lb — Pound
L — Liquid
LC — Liquid concentrate
LS — Liquid solution
oz — Ounce
(R) — Restricted Use
S — Soluble
SC — Spray concentrate
SP— Soluble powder
WP — Wettable powder

Who to call

Use the following telephone numbers in case of emergency:

Poison Control Center — Children's Memorial Hospital (Omaha) ..... **(800) 955-9119**
CHEMTREC — Pesticide Emergency Network ..... **(800) 424-9300**
EPA — Environmental Protection Agency
Lincoln ..... **(402) 471-5080**
Kansas City, KS ..... **(913) 236-2800**
Nebraska Department of Environmental Control (DEC) ..... **(402) 471-2186**
Nebraska State Patrol ..... **(800) 525-5555**
Nebraska Department of Agriculture — Bureau of Plant Industry ..... **(402) 471-2341**
Nebraska Natural Resources Commission ..... **(402) 471-2081**

Minimum number of days between application and harvest for selected crops

	Apple	Cabbage	Cucumbers	Green Beans	Leaf Lettuce	Peppers	Sweet Corn	Tomatoes
(R) *Ambush 2E, 25W*	***	1	0	NR	1	3	1	NR
(R) *Asana XL*	21	3	3	3	NR	7	1	1
Comite 6.5 EC	NR	NR	NR	NR	NR	NR	NR	NR
Cygon 400	28	3	NR	0	14	0	NR	7
Dipel 2X, ES, 10G	0	0	0	0	0	0	0	0
(R) *Di-Syston 8EC*	NR	42	NR	60	*	NR	NR	30
(R) *Di-Syston 15G*	NR	42	NR	60	*	*	NR	NR
(R) *Dyfonate 4EC*	NR	*	NR	*	NR	*	*	NR
(R) *Dyfonate II 20G*	NR	*	NR	NR	NR	NR	30	NR
(R) *Furadan 4F*	NR	NR	NR	NR	NR	NR	7	NR
(R) *Guthion 3F*	7	NR	NR	NR	NR	NR	NR	NR
Imidan 70WP	7	NR	NR	NR	NR	NR	NR	NR
(R) *Lannate 1.8L*	8	1	1-3	1-3	NR	3	0	1
Lorsban 4E	NR	*	NR	NR	NR	NR	35	NR
Malathion EC, Cythion 57EC	3	7	1	1	14	3	5	1
(R) *Metaxystox-R 2SC*	NR	7	**	21	NR	**	7-21	NR
(R) *Parathion 8E (ethyl)*	NR	NR	NR	NR	NR	NR	12	NR
Penncap-M	14	21	NR	3	NR	NR	3	15
(R) *Pounce 3.2EC*	***	1	0	NR	1	3	1	NR
Sevin 80S, XLR Plus	1	3	0	0	14	0	0	0

NR = Not Registered
* = At or prior to planting time application only
** = Registered, preharvest interval not indicated on label
*** = Do not apply after petal fall

Field re-entry periods

Most labels indicate the re-entry period as a minimum time period that must elapse before entering the treated area, unless the worker wears protective clothing. Follow label directions and do not enter fields after treatment until the re-entry period has passed.

(R) *Ambush 2E, 25W* — 24 hours
(R) *Asana XL* — 12 hours
Comite 6.5EC — 7 days
(R) *Counter 15G, 20CR* — 48 hours (72 hours*)
Cythion — 12 hours
Dimethoate 400 — 48 hours
Dipel, all formulations — 12 hours
(R) *Di-Syston 8EC, 15G* — 48 hours (72 hours*)
(R) *Dyfonate II 20G, 15G, 4EC* — 48 hours (72 hours*)
(R) *Force 1.5G, 3G* — 48 hours
(R) *Furadan 4F* — 48 hours
— 14 days (corn, sunflowers, sorghum)
(R) *Guthion 3F, 50WP, 2S* — 48 hours (72 hours*)
Imidan 70WP — 24 hours
(R) *Karate* — 24 hours
(R) *Lannate LV, 90 SP* — 48-72 hours (depending on crop)
Larvin 3.2F — 12 hours
Lorsban 4E — 24 hours
15G — 12 hours
Malathion ULV, 57EC — 12 hours
(R) *Metasystox-R 2E* — 48 hours (72 hours*)
(R) *Parathion (ethyl and methyl)* — 72 hours (6 days for corn)
(R) *Penncap-M* — 48 hours
(R) *Pounce 3.2EC* — 24 hours
Sevin, all formulations — 12 hours
(R) *Thimet 20G, 15G* — 48 hours (72 hours*)

*REI for areas with less than 25 inches of rainfall

Sugarbeet insects

Sugarbeets require a long growing season to develop maximum sugar content. During this period, they are subject to attack by insects, both above and below ground. Good production practices such as proper seed bed preparation, crop rotation, fertilization, and proper irrigation tend to minimize pest damage.

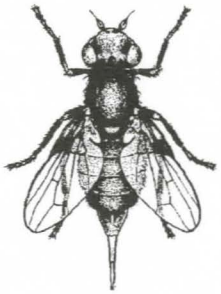
Insect problems on sugarbeets in the Nebraska Panhandle are sporadic. The most common insect pests are the sugarbeet root maggot, cutworms, wireworms, and the sugarbeet root aphid. Several other insect pests can cause sporadic problems in sugarbeets. These are the seedcorn beetle, seedcorn maggot, sugarbeet webworm, symphylans, and flea beetle.

Germinating and young seedling sugarbeets are sensitive to insecticides alone and possibly in combination with herbicides. All of the soil insecticides registered for use on sugarbeets have been shown to exhibit some phytotoxicity on this crop under certain conditions. The organophosphates are the most phytotoxic while carbamates are less phytotoxic. Extreme care must be taken to follow product label recommendations on placement and to prevent any chemical from making direct contact with the seed. The least potential for phytotoxicity results from placements behind the planter presswheels. Even with these precautions phytotoxicity may occur. Because of the potential for significant stand loss, especially when planting to stand, use planting-time insecticides only when absolutely necessary to control damaging insect populations.

Sugarbeet root maggot

In western Nebraska, root maggot flies begin to emerge from the soil in early May. Peak emergence and fly activity occurs in late May or early June. During and shortly after this peak fly activity, egg laying occurs in the sugarbeet fields. The larvae hatching from these eggs feed on the sugarbeet roots causing root damage and possibly stand loss.

Sugarbeet growers in areas where the sugarbeet root maggot is a problem can improve their management of this insect by using the orange sticky-stake fly-trapping method. This sugarbeet root maggot adult trapping method can be used to monitor the development of fly populations in and around sugarbeet fields in May and June. The orange sticky-stake trapping method should be deployed by May 1 in order to catch the first fly activity of the season. In many areas of the region root maggot populations fluctuate and without information on the populations there is no way to determine the need to treat. Growers in these areas may waste dollars on treatments that aren't needed or be caught off guard when a problem eventually develops. In areas where the root maggot is a continuously serious problem, growers have had serious control problems even with the use of planting-time insecticides. The fly-trapping method can be used to determine both the need and the proper timing for a supplemental lay-by treatment that will improve control in these serious situations.



Sugarbeet root maggot fly

Sugarbeet root maggot

Cutworms

Army cutworm

The army cutworm and the pale western cutworm are the two most damaging cutworms in sugarbeets in western Nebraska. Both cutworms are most likely to be a problem in sugarbeets where a winter cereal has been used as a cover crop before the sugarbeets. These cutworms can also be a problem along field margins where they move from adjacent grasses into sugarbeets early in the season. Because these insects begin development in the fall (army cutworm) or in the early spring (pale western cutworm) they are quite large by the time sugarbeets begin to emerge in late April or early May. As a result they can cause a great deal of damage very quickly with significant damage resulting from as few as one cutworm every 10-20 feet of row. Scouting and rapid application of rescue treatments are needed to obtain optimum control of this insect.

Wireworms

Wireworm

Wireworms can cause considerable damage to sugarbeets because they feed on the seed and roots of young seedlings. Plants that are slow to establish and grow will be more susceptible to wireworms. Wireworm baits can be used to identify fields that have a greater risk of damage; however, baiting must be done the previous fall because soil temperatures before sugarbeet planting will not be warm enough to allow the baits to work properly.

Sugarbeet root aphid

The sugarbeet root aphid can often be seen on sugarbeet roots in western Nebraska. The aphid migrates into sugarbeet fields from narrowleaf cottonwood trees in the mountains where it overwinters in mid-June to early July. Populations build up on the beets through the summer. Reduced sugar yields will result if populations become extremely high on the beet roots. The amount of root aphid damage is likely to be quite low because most common adapted varieties are resistant.

Read the entire pesticide label before making insecticide decisions.

Registered for control of sugarbeet insects

Rate is active ingredient per acre unless otherwise noted.

Insecticide	Insect	Rate	Restrictions and comments
aldicarb			
(R)*Temik 15G*	aphids root maggot	4.5-9.5 oz form***	Applied at planting or post emergence. Check label for placement instructions.
	leafhoppers leafminers	9.5-13.5 oz form***	

Use of aldicarb is not recommended due to possible ground water contamination. Excess irrigation or rainfall, a soil pH lower than 6, coarse textured (sandy) soils, soil temperatures less than 50°F, and soil organic matter under 1 percent are likely to lead to reduced degradation of aldicarb and may cause residues to move deeper into the soil, possibly resulting in ground water contamination.

(continued)

Registered for control of sugarbeet insects ***(continued)***

Rate is active ingredient per acre unless otherwise noted.

Insecticide	Insect	Rate	Restrictions and comments
carbaryl			
Sevin XLR Plus, 80S	armyworms grasshoppers leafhoppers webworms	1.5 lb	Wait 14 days before harvest.
	flea beetles	1.0-1.5 lb	
Sevin 5% bait	grasshoppers cutworms	2.0 lb	Wait 14 days before harvest.
chlorpyrifos			
Lorsban 4E	beet armyworm	0.75-1.0 lb	Wait 30 days before harvest. Apply only 8 pints total per season.
	cutworms flea beetles	1.0 lb	
	grasshoppers	0.25-0.5 lb	
	sugarbeet root maggots	0.33-1.0 lb	See label for optimum rates and timing.
	webworms	0.5-1.0 lb	
Lorsban 15G	root maggots cutworms	4.5-9.0 oz form* 6.6-9.0 oz form*	Apply at planting. See label for placement instructions.
	root maggots	6.5-9.0 oz form*	Applied post emergence. Only one application per season.
diazinon			
diazinon 14G	root maggots	4.7-9.4 oz form*	Apply at planting or post emergence. See label for placement instructions.
	wireworms	21-28 lb form/A	Preplant broadcast and incorporate 4-8 inches deep. Do not apply more than 28 lbs/acre per season.
AG500, 50W	wireworms	3-4 lb	Preplant broadcast and incorporate 4-8 inches deep.
	aphids grasshoppers leafhoppers leaf miners	0.5 lb	
fonofos			
(R) *Dyfonate 4EC*	symphylans wireworms	4 lb	Broadcast prior to planting and incorporate.
(R) *Dyfonate 10G*	symphylans wireworms	40 lb form/A	Broadcast prior to planting and incorporate.
(R) *Dyfonate II 20G*	root maggots	5-7.5 lb form/A	Apply at planting. See label for placement instructions.

(continued)

Registered for control of sugarbeet insects ***(continued)***

Rate is active ingredient per acre unless otherwise noted.

Insecticide	Insect	Rate	Restrictions and comments
malathion			
57EC	aphids grasshoppers	1.0-1.25 lb 1.875 lb	Wait seven days before grazing tops.
ULV 9.33	root maggots adults grasshoppers	0.6 lb	
methomyl			
(R) *Lannate LV, 90SP*	beet armyworm webworms	0.5 lb	Wait seven days before harvest, 30 days before grazing tops.
naled			
Dibrom 8EC	leafhoppers	1.0 lb	Wait two days before harvest.
oxydemeton-methyl			
Metasystox-R	aphids leafhoppers	0.37-0.75 lb 0.75 lb	Do not apply more than two times per season. Wait 30 days before using either beets or beet tops for feed or forage.
phorate			
(R) *Thimet 20G*	aphids root maggots leafhoppers leafminers	4.5 oz form**	Apply at planting. Do not place granules in direct contact with seed. See label for placement instructions. Wait 30 days before harvest. Do not feed tops or silage to dairy cattle.
terbufos			
(R) *Counter 15G*	root maggots wireworms white grubs	4-8 oz form**	Apply at planting. See label for placement instructions.
	root maggots	4-8 oz form**	Postemergence application. One application per year.
(R) *Counter 20CR*	root maggots wireworms white grubs	3-6 oz form**	Apply at planting. See label for placement instructions.
	root maggots	3-6 oz form**	Postemergence application. One application per year.

* Rate per 1,000 row feet (any row spacing).
** Rate per 1,000 row feet (minimum 20" row spacing).
*** Rate per 1,000 row feet (22" row spacing).

Dry bean insects

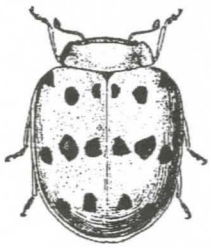
Nebraska dry beans are primarily grown in the Panhandle and southwest part of the state. Major insect pests are the western bean cutworm and the Mexican bean beetle.

For more information on this subject, refer to Extension NebGuide G86-786.

Mexican bean beetle

Mexican bean beetles overwinter as adult beetles in field debris in and around bean fields. These adults begin feeding on beans shortly after the plants emerge in early to mid-June. The adults lay their eggs on the foliage in June and early July. When the eggs hatch the larvae feed on the beans until they mature and pupate in late July and early August. Feeding damage will increase dramatically for the larger larvae and the adults. The subsequent adult generation will lay eggs and a second complete generation will develop. Because the plants will be maturing, little damage will result from this second generation unless high numbers are present and feeding occurs on the remaining green pods.

Control of the overwintering adults should not be needed unless defoliation of the vegetative beans reaches about 40 percent. Avoiding early planting will reduce the likelihood of early season problems. Consider control measures for the first generation larvae when one or more egg masses are found per six plants or one larvae per plant is found. Later, control should be considered if defoliation is expected to exceed 10-20 percent and the plants have not begun to turn yellow.



Mexican bean beetle adult

Mexican bean beetle larva

Western bean cutworm

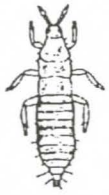
Western bean cutworm moths begin to emerge in early July. The peak moth flight in western Nebraska is in the later half of July. This moth flight can be monitored by using pheromone traps to attract the male moths. Pheromone traps will indicate the time of the peak flight and to some extent the size of the population.

Shortly after peak, maximum egg laying will occur. The young larvae feed on buds and young leaves. As they mature the larvae feed on pods and seeds. Under heavy infestations this will reduce bean yield and quality. Larvae feed on the plants at night and spend the days in the soil and consequently are very difficult to locate in the bean fields.

Pheromone trap counts can be used to determine the potential for cutworm damage. If trap catches accumulated from the beginning of the moth flight (early July) exceed 500-700 moths per trap at the peak catch, the potential for damaging populations exist. At this point further sampling of adjacent corn fields to determine the extent of cutworm infestations in the corn and examination of the pods to detect the onset of pod feeding can be done to further establish the likelihood of a problem. If severe cutworm damage is expected based on pheromone or other sampling, the best time to treat is two to three weeks after the peak moth catch with pheromone traps.

Western bean cutworm

Thrips

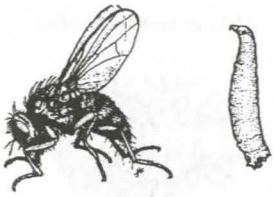


Thrips larva

Thrips are tiny insects (1/25 inch long) that feed by sucking plant juices from the bean leaves, causing a cupping of the leaves. These symptoms are most likely to occur and are most severe in beans under moisture stress. The greatest potential for damage exists in areas where beans are grown adjacent to winter wheat fields.

The primary management recommendation is to avoid situations where beans are under prolonged moisture stress. Irrigation will reduce the stress, and if sprinkler irrigation is used (or a good rainfall occurs) thrips populations will be reduced. If sprinkler irrigation is not possible or feasible, insecticide treatments may be needed. Treatment thresholds are not available for these insects. Colorado entomologists have not observed losses with fewer than 15 onion thrips per plant. However, they stress that higher numbers can be tolerated and both thrips and damage symptoms need to be present to justify treatment. A second species, the flower thrips, may feed on blossoms resulting in pod abortion. Economic levels for these thrips also are not known, but four to six thrips per blossom have caused pod loss in Colorado. Beans normally undergo a certain amount of pod loss, and the importance of this loss is uncertain.

Seedcorn maggots



Seedcorn fly and maggot

Seedcorn maggots can occasionally cause problems in dry beans planted into heavy small grain stubble. The maggots feed on the cotyledons, hypocotyl, and perhaps even bore into the stem. Damaged plants will be stunted, wilted or perhaps show distorted growth. Maggot flies are attracted to decaying organic matter. In high risk situations use seed treatments to reduce problems from this insect. Also, planting to ensure rapid germination and emergence will reduce the potential for problems.

Read the entire pesticide label before making insecticide decisions

Recommendations for control of dry bean insects

Rate is active ingredient per acre unless otherwise noted.

Insecticide	Insect	Rate	Restrictions and comments
acephate			
Orthene 75S	grasshoppers	0.25-0.5 lb	Wait 14 days to harvest. Do not feed treated vines to livestock.
	aphids cutworms leafhoppers Mexican bean beetle Thrips	0.5-1.0 lb	Do not apply to dry beans within 30 days of harvest. Do not exceed four applications per season. Do not feed or ensile treated forage.
aldicarb			
(R) *Temik 15 G*	aphids	5.5-7.5 oz form*	Do not apply to dry beans within 90 days of harvest. Do not make more than one application per season. Do not feed. See label for placement instructions.
	seedcorn maggot	4-5.5 oz form*	
	leafhoppers Mexican bean beetle mites	7.5-15 oz form*	

(continued)

Recommendations for control of dry bean insects *(continued)*

Rate is active ingredient per acre unless otherwise noted.

Insecticide	Insect	Rate	Restrictions and comments
aldacarb (continued)			
Use of aldicarb is not recommended due to the possibility of ground water contamination. Excess irrigation or rainfall, a soil pH lower than 6, coarse textured (sandy soils), soil temperature less than 50°F, and soil organic matter under 1 percent are likely to lead to reduced degradation of aldicarb and may cause residues to move deeper into the soil, possibly resulting in ground water contamination.			
carbaryl			
Sevin 80S, XLR Plus	flea beetle leafhopppers thrips western bean cutworm	1.0 lb	Do not apply to wet foliage or in rain or high humidity. No harvest restrictions.
	Mexican bean beetle	0.5 lb	
dimethoate			
Cygon 400	aphids grasshoppers leafhoppers Mexican bean beetle	0.25-0.5 lb	No waiting period for harvest of beans. Do not feed treated vines.
disulfoton			
(R) *Di-Syston 8EC*	aphids leafhoppers Mexican bean beetle thrips	0.9-1.9 oz form*	At planting or post emergence. Wait 60 days before harvest. Apply in a 6- to 8-inch band and lightly incorporate. Avoid seed contact.
(R) *Di-Syston 15G*	aphids leafhoppers Mexican bean beetle thrips	6-12 oz form*	
endosulfan			
Thiodan 3EC, 50WP	aphids Mexican bean beetle	0.5-1.0 lb	Do not exceed three applications per year. Do not feed threshings or allow livestock to graze in treated fields.
	western bean cutworm	1.0 lb	
esfenvalerate			
(R) *Asana XL 0.66EC*	Mexican bean beetle	0.015-0.03 lb	Do not exceed 0.2 lb AI/acre per season. Do not feed or graze livestock on treated vines. Wait 21 days before harvest.
	aphids grasshoppers leafhoppers cutworms western bean cutworms	0.03-0.05 lb	

(continued)

Read pesticide label before making insecticide decisions.

Recommendations for control of dry bean insects *(continued)*

Rate is active ingredient per acre unless otherwise noted.

Insecticide	Insect	Rate	Restrictions and comments
malathion			
57EC	aphids leafhoppers	1.25 lb	Wait one day before harvest.
	Mexican bean beetle	0.94-1.25 lb	
ULV 9.33	leafhoppers Mexican bean beetle	0.6 lb	Wait one day before harvest.
methomyl			
(R) *Lannate LV, 90SP*	Mexican bean beetle	0.225-0.9 lb	Do not apply within 25 days of harvest.
methyl parathion			
(R) *Penncap-M*	aphids leafhoppers Mexican bean beetle	0.5 lb	To avoid injuring bees, do not apply during the period from seven days prior to first bloom through peak bloom. After this time, apply to beans as long as bees are not actively visiting the area. Do not apply within 15 days of harvest.
naled			
Dibrom 8EC	aphids	1.0 lb	Wait four days before harvest.
phorate			
(R) *Thimet 20G, 15G*	aphids leafhoppers thrips Lygus bugs mites seedcorn maggot	4.5-7.0 oz form**	Distribute the granules evenly in the row to the side of the seed at planting. Do not place granules in direct contact with seed. Do not feed the foliage of treated beans within 60 days of treatment.
	Mexican bean beetle	4.5-9.4 oz form**	

* Rate per 1,000 row feet (any row spacing).
** Rate per 1,000 row feet (minimum 30" row spacing).

Sunflower insects

Sunflowers serve as a host for numerous insects including several important pest species. Essential to the successful management of sunflower insect pests are an effective scouting program, adherence to established economic thresholds (which vary depending on whether sunflowers are grown for oil or seed (confectionery and bird seed)), and proper timing of insecticide applications.

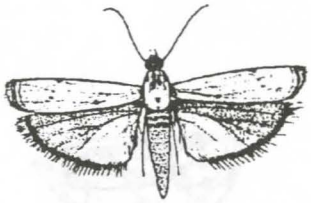
For more information on this subject, refer to Extension NebGuide G91-1026.

Spraying blooming sunflowers can be extremely hazardous to bees. Coordinate all insecticide applications with local beekeepers before applying insecticides.

Sunflower (head) moth

The sunflower (head) moth is generally considered to be the most serious insect pest of sunflowers. The buff to gray colored moths are approximately 3/8 inch long with a 3/4 inch wing span. When at rest, the wings are rolled tightly against the body giving the insect a cigar-shaped appearance. Eggs are deposited among the florets on the face of the flower head. Eggs hatch within 40-72 hours, and larvae begin to feed on florets and developing seeds. Most eggs are laid by the third day after the onset of bloom, and up to 90 percent are laid within seven days after onset of bloom.

Planting after June 1 will reduce the potential for head moth damage. If moth flights do not occur at the same time as the early bloom of the sunflowers, damage will be minimized. Moth flights can be monitored with pheromone traps. Field scouting should start when the first moths are caught in pheromone traps. Scout and treat for the sunflower moth in the evening when moths are most active. Consider treatment if one to two adults are found per five plants at the beginning of bloom. Fields that are yet to bloom or are in full bloom at the first appearance of the head moth have a much reduced potential for severe damage.



Sunflower (head) moth

Banded sunflower moth

The banded sunflower moth, which emerges in July, has tan wings with a dark brown band across the wings. Its wingspan is about 1/2 inch. Females are attracted to sunflowers that are in the late bud stages where they lay their eggs. The eggs develop and hatch during the early blooming stages and the larvae begin to feed on the florets and eventually feed within the seed. Larvae feed within the developing seed and will chew an exit hole in the seed. Unlike the seed weevils they will eat the entire contents of the seed and these seeds will likely be blown through the combine. Banded moth larvae also will feed on multiple seeds. Late planting (after June 1) will likely reduce the severity of this pest in most instances. North Dakota has set their threshold at one moth per two plants. Begin scouting for these moths when the sunflowers are in the R-3 stage. Scout fields in the late evening when the moths are most active.

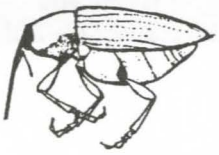
Banded sunflower moth

Cutworms

Cutworm

Predominant species include pale western, dingy, dark-sided and sandhill cutworms. These early season pests are nocturnal feeders which partially defoliate plants or cut them off at or below the soil surface. Scout for leaf feeding, wilted plants or plants that have been cut off. The greatest threat to sunflowers is from the loss in stand as the cutworms feed. Actively feeding cutworms and stand losses approaching 10-20 percent may warrant treatment.

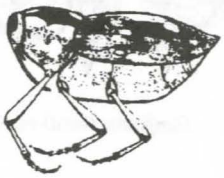
Seed weevils



Red seed weevil

Two species of seed weevils occur in Nebraska. The red seed weevil is slightly over 1/8 inch in length. The grey seed weevil is about 1/4 inch in length. Both have prominent snouts. Adults of both species lay eggs in the newly developing seeds and the C-shaped, legless larvae feed within the seed. Control is directed at the adults to prevent egg laying. Consider treatment if 14 (oil) or one (confectionery) adults are found per plant during the early stages of bloom. Treatments in late bloom will not control the larvae that result from eggs laid in early bloom. The thresholds for seed weevils in oil type sunflowers should be adjusted up or down depending on control costs and market value.

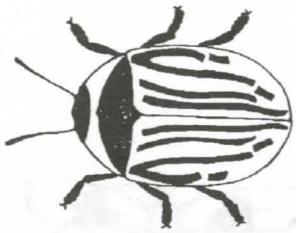
Stem weevil



Stem weevil

The stem weevil is about 3/16 inch long and grayish-brown with white dots on its wing covers. Adults are often found in the leaf axils in early summer. Eggs are laid in the lower portion of the stalk where resulting larvae will begin to feed. As the larvae develop they will move to the lowest part of the stalk near the soil line where they will form an overwintering chamber. The presence of several overwintering chambers from these larvae reduces stalk strength and may cause lodging. Direct control at adult weevils. Treat if two adults are found per plant at the 14-leaf to early bud stage. Scouting for these insects is very difficult because the adults are small and hard to see.

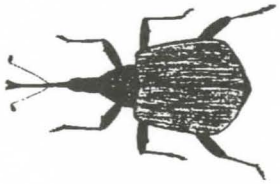
Sunflower beetle



Sunflower beetle

The sunflower beetle is cream colored with three dark stripes on each wing cover. The head is reddish-brown. These beetles are 1/4-3/8 inch long and resemble Colorado potato beetles. The larvae are yellowish-green and hump-backed in appearance. These are early season pests and larvae appear shortly after the adults. Consider treatment if one to two adults or 10-15 larvae are found per seedling.

Head-clipper weevil



Head-clipper weevil

This 1/4 inch long, metallic black weevil is active for a short time in mid to late summer. Females girdle the stem just below the developing head. Eggs are laid in the head, which later drops. Severe damage is usually limited to field borders and seldom would require treatment. Control guidelines have not been established for this insect and no insecticides are specifically registered for its control.

Registered for control of sunflower insects

Rate is active ingredient per acre unless otherwise noted.

Insecticide	Insects	Rate AI/Acre	Restrictions and comments
carbaryl			
Sevin 80S, XLR Plus	cutworms	1.5 lb	Do not apply within 60 days of harvest. Do not allow livestock to graze in treated areas.
	grasshoppers	1.0-1.5 lb	
	stem weevils sunflower beetle	1.0-2.0 lb	
carbofuran			
(R) *Furadan 4F*	sunflower moth banded sunflower moth seed weevils stem weevils	0.5 lb	Do not apply within 28 days of harvest. Do not apply more than four times per season.
	grasshoppers	0.125-0.5 lb	
	sunflower beetle	0.125-0.25 lb	
	stem weevils grasshoppers sunflower beetle	2.5-5.0 fl. oz.*	In-furrow or in a 7-inch band at planting time.
chlorpyrifos			
Lorsban 4E	sunflower moth banded sunflower moth seed weevils stem weevils sunflower beetle	0.5-0.75 lb	Do not apply within 42 days of harvest. Do not allow livestock to graze in treated areas. Do not apply more than 4.5 lbs AI (9 pints formulation) per acre per season.
	grasshoppers	0.5 lb	
	cutworms	1.0-1.5 lb 1.0-2.0 lb	Preplant incorporated into top 2-4 inches of soil.
Lorsban 15G	cutworms	8 oz form*	Use a 7-inch band at planting time.
endosulfan			
Thiodan 50 WP, 3EC	sunflower moth	1.0 lb	No harvest restriction. Do not exceed three applications per season. Do not feed treated forage to livestock.

Read pesticide label before making insecticide decisions.

(continued)

Registered for control of sunflower insects *(continued)*

Rate is active ingredient per acre unless otherwise noted.

Read pesticide label before making insecticide decisions.

Insecticide	Insects	Rate AI/Acre	Restrictions and comments
esfenvalerate			
(R) *Asana XL 0.66EC*	sunflower beetle	0.015-0.03 lb	Do not apply within 28 days of harvest. Do not exceed 0.2 lb AI per acre per season.
	sunflower moth banded sunflower moth grasshoppers cutworms seed weevils stem weevils	0.03-0.05 lb	
methidathion			
(R) *Supracide 2E*	sunflower moth banded sunflower moth seed weevils stem weevils	0.5 lb	Do not apply within 50 days of harvest. No more than three applications at least seven days apart. Do not graze treated areas or feed treated forage to livestock.

* Rate per 1,000 row feet.

Grasshoppers

Grasshopper

Consider treating for grasshoppers in sunflowers when eight or more are found per square yard and/or there is 25 percent defoliation. Grasshopper control is most effective when directed at the smaller immature stages. For the species that cause problems in field crops, the best control period is late June and early July because adults become more numerous later in July.

For more information on grasshopper treatment, refer to Extension NebGuide G86-791.

Registered for control of grasshoppers in non-crop and waste areas

Rates are active ingredient per acre unless otherwise noted.

acephate (Orthene 75S)	0.25 lb	Do not graze/feed.
carbaryl(Sevin 80S, XLR Plus, Sevin 4-Oil)	0.5-1.5 lb	
diazinon AG500	0.375-0.5	
(R) *esfenvalerate* (Asana XL 0.66 EC)	0.015-0.03 lb	Do not feed treated crop to livestock.
phosmet (Imidan 50-WP)	3-4 lb	Do not graze/feed. Field margins only.
malathion ULV 9.33	8-12 fl oz form/acre	

Vetch insects

Insect management is important in producing vetch seed. Particular care must be taken so that beneficial pollinators are not poisoned. Refer to guidelines provided in the alfalfa section of Extension publication EC90-1511 with regard to bee protection.

While several insects may attack the vetch crop, the pea aphid and vetch bruchid are probably the most important. Pea aphids are sucking insects which remove sap from stems and leaves. The vetch bruchid is a small beetle which deposits its eggs in seed pods with the larvae feeding on the developing seeds. Apply insecticides to kill adult bruchids before they lay eggs. This should be done as the first pods appear in the fields and the temperature is 60°F or higher.

Registered for control of vetch insects

Rate is active ingredient per acre unless otherwise noted.

Insecticide	Insects	Rate AI/acre	Restrictions and comments
malathion 57EC	pea aphid vetch bruchid	1.0-1.25 lb	No harvest restrictions.
(R) *methyl parathion 4E*	vetch bruchid	0.5 lb	Pre-bloom only. No harvest restrictions.

Read pesticide label before making insecticide decisions.

Potato insects

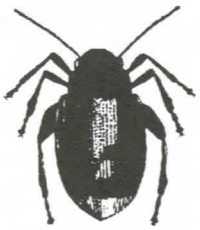
Even minor feeding injury on potato tubers can leave them unmarketable. This increases the importance of routine insect scouting for threatening pest infestations.

For more information on this subject, refer to Extension NebGuides G79-452 and G79-454.

Soil insects

Flea beetles

Two species of flea beetle larvae attack the potato tuber, by either etching the surface or making small tunnels (referred to as "slivers") in the tuber. Adults overwinter in field margin areas and begin to feed on potato leaves when they first emerge. The adults cause shotholing of the leaves. The most damage is caused by the larvae as they feed on the roots and tubers.



Flea beetle

Wireworms

Wireworm

Wireworms are difficult to control. Damage is most likely when potatoes are planted after sod or wheat. These hard-bodied, slender brown larvae bore into underground stems causing the young plants to wither and die. Later season damage will result in damaged tubers. This damage results in long slender tunnels that are lined with periderm and normally do not become infected with secondary organisms (rot).

Avoid planting potatoes on ground that has been recently broken out of sod. Also, do not regularly include wheat in a rotation with potatoes. Wireworms may take up to five years to complete their life cycles. Therefore, problem areas may remain a problem for several years. Control options include a preplant broadcast or planting time insecticide. Post emergence applications will not be effective for wireworm control because the insecticides will not be able to be moved adequately into the soil where the wireworms feed.

Read pesticide label before making insecticide decisions.

Registered for control of soil insects on potatoes

Rate is active ingredient per acre unless otherwise noted.

Insecticide	Insects	Rate AI/acre	Restrictions and comments
diazinon			
14G, 50W AG500	wireworms	3-4 lb	Preplant broadcast application; in corporate immediately 4-8 inches deep by disk or harrow.
disulfoton			
(R) *Di-Syston*	flea beetles	15.0 to 23.0 oz form*	Band application at planting. Do not apply within 75 days of harvest. Apply lower rate for lighter soils and higher rate for heavier soils.
ethoprop			
(R) *Mocap 10G, 15G, 20G*	wireworms and symphylans	33.6 oz form* 27 oz form* 16 oz form*	Use a 12-inch band application at planting. Mix into top 2-4 inches of soil.
(R) *Mocap 10G, 15G, 20G, 6EC*	wireworms and symphylans	4-6 lb	Preplant broadcast and incorporate into top 2-4 inches of soil.
(R) *Mocap 6EC*	wireworms and symphylans	3 lb	Use a 12-inch band application at planting. Mix into top 2-4 inches of soil.
fonofos			
(R) *Dyfonate 4EC, 10G*	wireworms and symphylans	4.0 lb	Preplant broadcast application and incorporate into soil.
phorate			
(R) *Thimet 20G* *Thimet 15G*	flea beetles and wireworms	11.3-17.3 oz form*	Band application at planting or in-furrow. Lower rate is for sandy soils. Wait 90 days before harvest.

* Rate per 1,000 row feet.

Foliage / stem-feeding insects

Potatoes can withstand some defoliation without yield loss. Potatoes are most susceptible to yield loss from defoliation when tubers begin to form (pea-sized or larger) and for three weeks thereafter. Treatments are suggested if defoliation exceeds 15 percent during this period, and if defoliation exceeds 30 percent before or after this period.

Cutworms

Several cutworm species are known to damage potatoes. Cutworms may feed at the soil surface, below the ground or climb on the plants and feed. Because they feed primarily at night, they are often difficult to locate.

Cutworm

Colorado potato beetle

Immature beetles (larvae) cause the most defoliation damage. If defoliation levels exceed suggested guidelines (see above), achieve the best control with foliar sprays after peak egg hatch but before larvae are more than half grown.

Colorado potato beetle larva

Colorado potato beetle adult

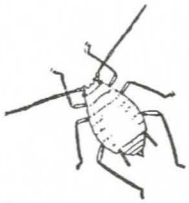
European corn borer

Corn borer larvae tunnel into the potato stalk soon after hatch. Potato plants can tolerate damage to as many as 20 percent of the stems with no yield loss. Control would be needed if the number of affected stems approaches 20 percent and there are still moths active or eggs masses left to hatch. The timing of peak moth flights can be determined with the use of light or pheromone trap data. If control is needed, thorough coverage of the potato foliage will improve control. Borers that have entered the stem at the time of treatment will not be controlled.

European corn borer

Aphids

The primary aphid of concern in Nebraska potatoes is the green peach aphid. This insect is the primary vector of potato leaf roll virus. Green peach aphids can be monitored by examining one leaf from the lower half of a plant. This should be done with 10 plants at each of 10 sites in a field. For fresh market potatoes, begin treatment when 30 wingless aphids are found per 100 leaves. This treatment guideline should not be used for Russett, Burbank, other varieties susceptible to tuber net necrosis or seed potatoes. Suggested thresholds for these more sensitive situations range from 1 to 10 wingless green peach aphids per 100 leaves.



Green peach aphid nymph

Read pesticide label before making insecticide decisions.

Registered for control of foliar insects of potatoes

Rate is active ingredient per acre unless otherwise noted.

Insecticide	Insects	Rate AI/acre	Restrictions and comments
azinphos-methyl			
(R) *Guthion 2S, 3F, 50 WP*	European corn borer	0.5-.75 lb	Wait seven days before harvest.
	flea beetles	0.75 lb	
	Colorado potato beetle	0.375 lb	
carbaryl			
Sevin 80S, XLR Plus, 50W	Colorado potato beetle flea beetles leafhoppers	0.5-1.0 lb	No harvest restrictions.
	European corn borer	1.0-2.0 lb	
	cutworms	2.0 lb	
carbofuran			
(R) *Furadan 4F*	Colorado potato beetle European corn borer flea beetles leafhoppers	0.5-1.0 lb	Apply 14 days before harvest.
diazinon			
AG500, 50W	aphids flea beetles Colorado potato beetle	0.25-0.375 lb	Wait 35 days before harvest.
	leafhoppers	0.375-0.5 lb	
AG500, 50W, 14G	cutworms	2.0-4.0 lb	Apply preplant and incorporate.
dimethoate			
Cygon 400	aphids leafhoppers	0.5 lb	No harvest restrictions.
	grasshoppers	0.25-0.5 lb	
disulfoton			
(R) *Di-Syston 8EC*	aphids flea beetles leafhoppers psyllids Colorado potato beetle	2.25-3.5 fl oz form*	In-furrow at planting or side dress. Wait 75 days before harvest (soil).
	aphids	0.375-1.0 lb	Wait 30 days before harvest (foliar).
(R) *Di-Syston 15G*	aphids flea beetles leafhoppers psyllids Colorado potato beetle	15-23 fl oz form*	In-furrow at planting or side dress.

(continued)

Registered for control of foliar insects of potatoes *(continued)*

Rate is active ingredient per acre unless otherwise noted.

Insecticide	Insects	Rate AI/acre	Restrictions and comments
endosulfan			
Thiodan 50WP, 3EC	aphids armyworms Colorado potato beetle flea beetles leafhoppers plant bugs	0.5-1.0 lb	Do not exceed six applications per year or a maximum of 3 lb per acre per year. Do not follow potatoes with root crops other than carrots, potatoes, sugarbeets, or sweet potatoes.
	psyllids European corn borer	0.75-1.0 lb	
esfenvalerate			
(R) *Asana XL 0.66EC*	psyllids	0.015-0.03 lb	Do not graze livestock on treated vines. Do not exceed 0.35 lb AI/A per season. Wait seven days before harvest.
	aphids armyworms Colorado potato beetle cutworms European corn borer flea beetles grasshoppers leafhoppers	0.03-0.05 lb	
malathion			
57EC	aphids grasshoppers leafhoppers	1.25 lb	No harvest restrictions.
methamidophos			
(R) *Monitor 4*	aphids armyworms Colorado potato beetle cutworms European corn borer flea beetles leafhoppers	0.75-1.0 lb	Wait 14 days before harvest. Do not graze livestock.
methyl parathion			
(R) *Penncap-M*	Colorado potato beetle	0.5-1.5 lb	Wait five days before harvest.
	cutworms European corn borer flea beetles leafhoppers	0.5-1.0 lb	
	grasshoppers	0.5-0.75 lb	

(continued)

Read pesticide label before making insecticide decisions.

Registered for control of foliar insects of potatoes *(continued)*

Rate is active ingredient per acre unless otherwise noted.

Insecticide	Insects	Rate AI/acre	Restrictions and comments
permethrin			
(R) *Pounce 3.2EC, 25W*	armyworms Colorado potato beetle cutworms European corn borer flea beetles leafhoppers psyllids	0.1-0.2 lb	Wait seven days before harvest. Do not feed or graze forage.
(R) *Ambush 2E, 25W*	aphids Colorado potato beetle flea beetles psyllids	0.05-0.2 lb	Wait seven days before harvest. Do not apply more than 2.4 lbs AI/A per season.
phorate			
(R)*Thimet 20G*	aphids leafhoppers psyllids	11.3-17.3 oz form*	Band or in-furrow at planting. Use lower rate for sandy soils. Apply 90 days before harvest.
	Colorado potato beetle	17.3 oz form*	Band or in-furrow at planting. Wait 90 days before harvest.
phosmet			
Imidan 70WP	Colorado potato beetle flea beetles leafhoppers	1.0 lb	Wait seven days before harvest.

* Rate per 1,000 row feet.

Onion insects

The primary insect pests of onions in Nebraska are the onion maggot and onion thrips. In addition to the chemical controls listed below, crop rotation will aid in onion maggot management.

Onion maggot

The onion maggot adult is a gray-colored fly about 1/3 inch in length. Larvae are legless white maggots which mine into and consume bulbs causing plants to turn yellow and die. Partially damaged bulbs may increase storage problems.

Onions grown under dryland conditions and in dry climates are rarely damaged by the onion maggot. However, after a series of two or three wet springs, this insect can destroy up to 80 percent of the crop. There are three to four generations each year in Nebraska.

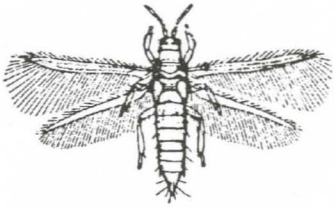
Avoid mechanical injury to onion plants and bulbs since damaged plants are more attractive to egg-laying adults. Removal or burial of culled onions immediately after harvest may reduce the potential for onion maggot problems. Also, crop rotation will aid in onion maggot management. Apply insecticides as seed or soil treatments to control the adults. Properly applied soil treatments should provide protection through midsummer. After this time, foliar sprays will be needed to reduce adult (fly) numbers. Time foliar treatments to coincide with peak adult activity. Proper timing is critical. Repeat treatments at 10-14 day intervals as needed.

Onion maggot

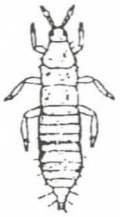
Onion thrips

Adult onion thrips are tiny (1/25 inch long), pale yellow to tan insects that have elongate bodies with four feathery wings folded over the backs. Nymphs resemble adults but are wingless and cream colored. Onion thrips feed on the foliage, producing light-colored streaks on the leaves. Small, black fecal spots also are associated with thrips damage. When numerous, thrips cause onion foliage to discolor and curl and bulb size can be significantly reduced.

Consider treating thrips when 10-20 thrips per plant are observed. Adequate soil moisture will reduce the impact of the thrips. Treatment must utilize maximum water volume and give complete coverage to penetrate new growth. Thrips may be resistant to organophosphate insecticides. If poor control is observed with these compounds, consider a follow-up treatment with a carbamate.



Onion thrips adult



Onion thrips larva

Cutworms

Cutworms are brown to black and commonly reach 1.5 inches in length at maturity. They feed at night and chew holes in bulbs and leaves. Cutworms are more often a problem in the spring and early summer. For best results, apply insecticides in late evening when damage is first observed. Repeat treatment as needed.

Read pesticide label before making insecticide decisions.

Registered for control of onion insects

Rate is active ingredient per acre unless otherwise noted.

Insecticide	Insects	Rate AI/acre	Restrictions and comments
azinphos-methyl			
(R) *Guthion 2S, 35 WP*	thrips	0.5-0.75 lb	Do not apply more than three times per season. Wait seven (green onions) or 28 (dry onions) days before harvest.
chlorpyrifos			
Lorsban 4E	onion maggot	1.1 fl. oz form*	Drench in-furrow. One application per year. Incorporate to depth of 1-2 inches.
Lorsban 15G	onion maggot	3.7 oz form*	Apply in-furrow at planting. One application per year.
diazinon			
14G	onion maggot	14-28 lb form/A	Broadcast prior to planting and incorporate 3-4 inches.
50W	onion maggot	4.0 lb	Apply at planting with sufficient water to drench seed furrow.
AG500	onion maggot	2-4 lb	Apply at planting with sufficient water to drench seed furrow.
AG500, 50W	thrips	0.5 lb	Wait 10 days before harvest.
fonofos			
Dyfonate 10G	onion maggot	1.0 lb	Apply in-furrow at planting. To be used on soils with greater than 10 percent organic matter.
(R) *Dyfonate 4EC*	onion maggot	1.0 lb	Apply in-furrow at planting. To be used on soils with greater than 10 percent organic matter.
malathion 57EC	onion maggot adults	1.0-1.6 lb	Wait three days before harvest.
	thrips	1.0-1.25 lb	Wait three days before harvest.
methomyl			
(R) *Lannate LV, 90SP*	thrips cutworms	0.90 lb	Add wetting agent. Wait seven (dry onions) or 28 (green onions) days before harvest.
methyl parathion			
(R) *Penncap-M*	thrips	0.5 lb	Wait 15 days before harvest.
permethrin			
(R) *Pounce 3.2EC, 25WP*	onion maggot cutworms	0.1-0.3 lb	Do not apply more than 2.4 lb AI per acre per season. Do not graze livestock in treated areas or cut treated crops for feed.
	thrips	0.15-0.3 lb	

* Rate per 1,000 row feet.

Decrease pests, increase profits

CropWatch, a University of Nebraska Extension newsletter, is published throughout the growing season to provide agricultural producers and consultants with timely pest management and crop production information. Extension agricultural specialists from Lincoln and throughout the state write regular pest updates as well as more indepth pieces explaining scouting and treatment recommendations, and pesticide use and regulations. Illustrations aid in pest identification and tables provide the latest pesticide information so readers can select the appropriate treatment plan.

One reader wrote that he saved more than $1,000 when he changed his pest treatment plan according to a newsletter recommendation. A one-year subscription includes 24-26 issues and costs $25. To order, fill out the coupon below and send it with a check to the address listed.

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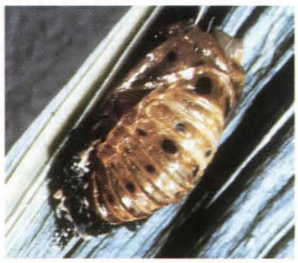
A variety of insects, mites, spiders and microbes often are important natural controls of pest insects and mites in Nebraska crops. It is important to be able to recognize them as beneficial. Use of nonchemical controls, such as crop rotations and plant resistance and use of economic thresholds to guide pesticide use will allow you to maximize the benefit of these organisms.

Lady beetle adult

Lady beetle eggs

Lady beetle larva



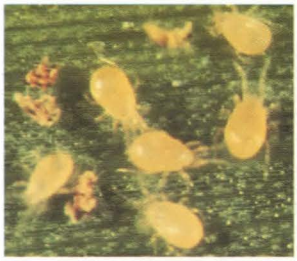
Lady beetle pupa

Green lacewing adult

Green lacewing larva

Minute pirate bug (*Orius*) adult

Minute pirate bug nymph

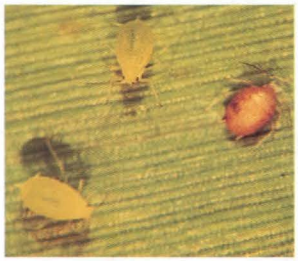


Predatory spider mites

Syrphid fly larva

Damsel bug or nabid adult

Crab spider



The brown shell on right is a greenbug that has been killed by a tiny parasitic wasp developing within it.

Insect parasite (tachinid fly)

Ground beetle or carabid larva

Fungal disease of caterpillar

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