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EC89-1537 1989 Insect Management Guide : Sugarbeets, Dry Beans, Sunflowers, Vetch, Potatoes, Onion

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1989 INSECT MANAGEMENT GUIDE

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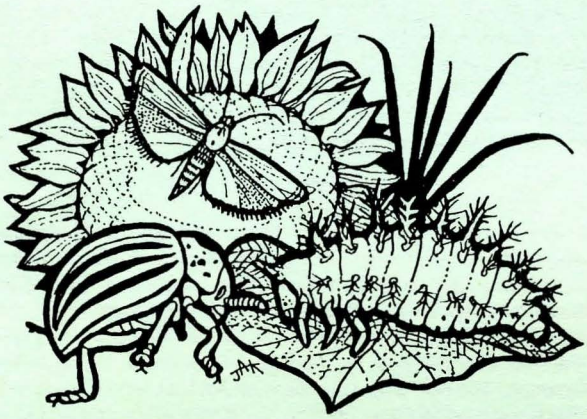

SUGARBEETS, DRY BEANS, SUNFLOWERS, VETCH, POTATOES, AND ONIONS

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Insect management suggestions in this circular are based on University of Nebraska test results, 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.

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 (Write - Bulletins, 105 ACB, University of Nebraska, Lincoln, NE 68583-0918) or from local Cooperative Extension Service Offices.

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There are several approaches to the management of insect pests in Nebraska. These include the use of cultural practices, resistant varieties, biological control, and/or insecticides. Before making a treatment decision, all appropriate management strategies should be considered. If insecticide use is indicated, consideration should be given to efficacy against the target pest or pest combination, label restrictions, formulation of the pesticide, cost, safety to non-target species (including humans), environmental conditions at the time of application, and other factors.

THE USER IS RESPONSIBLE FOR THE EFFECTS OF PESTICIDE RESIDUES ON CROPS AND LIVESTOCK, AS WELL AS PESTICIDE DRIFT AND CONTAMINATION. This publication does not supersede label information. Always read and carefully follow the instructions on the container label. For current information, contact your local Cooperative Extension Service Office.

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

TOXICITY OF INSECTICIDES
(NebGuides G85-758, G84-715, G79-460, G79-472, G79-473, G79-479)

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. 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.

(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 purchasing these chemicals. Your local Cooperative Extension Service office will have a listing of the dates and locations where certification training can be obtained. Remember that the status of a formulation can change at any time. When purchasing a pesticide, be certain to ask the dealer if the attached label is up to date.

WHO TO CALL

The following telephone numbers are provided for your use in case of emergency:

Poison Center - Children's Memorial Hospital (Omaha)
(800) 642-9999 (In Nebraska)
(800) 228-9515 (Out-of-State)

CHEMTREC - Pesticide Emergency Network
(800) 424-9300

EPA - Environmental Protection Agency
Lincoln, NE (402) 471-5080
Kansas City, KS (913) 236-2800

Nebraska Department of Environmental Control (DEC)
(402) 471-2186

Nebraska State Patrol (402) 471-2406

Nebraska Department of Agriculture -
Bureau of Plant Industry (402) 471-2341

Nebraska Natural Resources Commission
(402) 471-2081

IMPORTANT

Subscribe to the Insect, Plant Disease, and Weed Science Newsletter for the latest pest management recommendations, changes in pesticide registrations, and updates on the current status of insect pests. Full details and an order blank are provided on the last page of this circular.

MANAGEMENT DECISION GUIDELINES/ECONOMIC THRESHOLDS

Economic thresholds are flexible guidelines. They indicate the level of insect abundance or damage that can be tolerated before management actions should be taken. 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 of the crop, relative effectiveness of controls, and pesticide plus application costs. Timing and accuracy of application, as well as the effects of weather, also determine the ultimate degree of control.

CHEMIGATION

The term "chemigation" refers to the injection and application of chemicals through irrigation systems. Proper equipment needs, procedures for calibration and other instructions for application through center pivot systems are provided in NebGuides G84-703, Applying Insecticides Through Center Pivots, and G73-43, Anti-Pollution Devices for Applying Chemicals Through Irrigation Systems. The Nebraska Chemigation Act took effect January 1, 1987. This legislation requires that the applicator attend a training session and pass a written examination for CERTIFICATION as defined in the State Law. Among additional requirements is the provision that a PERMIT must be issued for the injection site verifying that all necessary anti-pollution equipment is installed and working properly. Injection site inspections will be performed by staff of the appropriate Natural Resources District. Copies of the law, rules, and regulations concerning chemigation are available from the Nebraska Department of Environmental Control, 301 Centennial Mall South, P.O. Box 94877, Lincoln, NE 68509-4877. In some cases, supplemental rules and regulations have been issued by individual Natural Resources Districts. These rules and regulations are available at the respective NRD offices.

ENDANGERED SPECIES ACT

Rules and regulations are pending concerning the impact of pesticides on endangered plant and animal species (e.g., Blowout Penstemon, Piping Plover, and Interior Least Tern) in certain areas of Nebraska. BEFORE applying any pesticide, refer to the Pesticide Use Bulletin For Protection of Endangered Species for the county you are working in, which is available from your local pesticide dealer, Cooperative Extension Service office, or the Environmental Protection Agency.

INSECT PREVENTION AND CONTROL IN FARM-STORED GRAIN (EC88-1534 and NebGuide 86-790)

Properly managed stored grain should have few insect problems during the first year of storage in Nebraska. If grain is to be stored for more than one year, additional effort is required to maintain quality. All bins should be inspected regularly for moisture content, temperature, mold development, and insect pests. 1) Push a sharp pointed stick or rod into the grain to see if hard, compacted areas are developing. 2) Check grain temperature at several locations. 3) Moisture content should also be monitored, even if the grain was dry when binned. 4) Collect several grain samples from the surface and as deep as possible into the grain with a grain probe. 5) Screen the samples and look for evidence of insects. 6) Turn on the aeration fan for a few minutes and smell the air. Does it smell normal or does it have a spoiled or musty odor? 7) In addition to following sound sanitation practices, using good aeration management and making regular inspections, insecticides and/or fumigation may be needed. For more detailed information on insect management and a listing of currently recommended bin sprays, grain protectants, and fumigants, see EC88-1534, "Pest Management of Farm-Stored Grain," available at your local Cooperative Extension Service office.

SEED TREATMENTS

Damage to corn, sorghum, soybean and other 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 through the use of an approved planter-box seed treatment containing diazinon and/or lindane prior to planting. THESE TREATMENTS ARE RECOMMENDED FOR ALL CORN, SORGHUM, AND SOYBEANS IN NEBRASKA. In fields that have a history of serious seed-feeding insect problems or in situations where stands have been seriously reduced and replanting is the only feasible recourse, a seed treatment plus an in-furrow application with an approved soil insecticide should be considered. 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 scouting on a regular basis to determine pest abundance and also 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.

INSECT PESTS IN CONSERVATION TILLAGE SYSTEMS

Modifications of the crop environment in conservation tillage systems could alter the relative importance of Nebraska's more traditional insect pests and possibly create conditions where normally incidental organisms achieve pest status. Cooler soil temperatures and slower drying in reduced tillage fields may delay planting in the spring and slow seed germination, leaving seeds and young plants susceptible to soil insects for longer periods. Improper placement and incorporation of soil insecticides may create additional problems where crop residues are heavy. Elimination of deep plowing and the resulting increased surface debris may permit certain insects to overwinter in greater numbers. While the use of reduced tillage raises some questions regarding pest control, anticipated problems should not be a barrier to the development of new techniques. It is highly unlikely that insects will be damaging in all fields, and the beneficial effects of conservation tillage appear to outweigh insect control considerations.

PROTECT BEES

Honeybees collect nectar and/or pollen wherever they can, including field crops such as corn, sorghum, soybeans and alfalfa. If bee colonies are nearby or bees are foraging in fields that are sprayed during flowering (pollen-shed stage for corn and sorghum), they may be killed in substantial numbers. To avoid injury to important pollinators, try to 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. In many cases, beekeepers will relocate bees from areas to be treated if given sufficient prior notice.

SPRAYED BY MISTAKE?

Gardens, particularly plantings of sweet corn, are often 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 recommend using vegetables or fruit that have been treated with a pesticide which is not labeled for that commodity. The following table 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.

Minimum Number of Days Between Application and Harvest For Some Selected Crops

Insecticide	Tomatoes	Peppers	Sweet Corn	Cucumbers	Cabbage	Leaf Lettuce	Green Beans	Apple
Ambush 2E	NR	3	1	NR	1	1	NR	***
Asana 1.9 EC	1	7	1	3	3	NR	NR	21
Counter 15G	NR	NR	30	NR	NR	NR	NR	NR
Cygon 400	7	0	NR	3	3	14	0	28
Diazinon AG500	1	5	0	7	7	10	7	NR
Diazinon 14G	**	**	**	**	**	**	**	NR
Dipel 2X	0	0	0	0	0	0	0	0
Di-Syston 8EC	30	NR	NR	NR	42	60	60	NR
Di-Syston 15G	30	NR	40	NR	14	NR	NR	NR
Dyfonate 4EC	*	*	*	NR	*	NR	*	NR
Dyfonate II 20G	NR	NR	30	NR	*	NR	NR	NR

Minimum Number of Days Between Application and Harvest For Some Selected Crops - Con't.

Insecticide	Tomatoes	Peppers	Sweet Corn	Cucumbers	Cabbage	Leaf Lettuce	Green Beans	Apple
Furadan 4F	NR	NR	7	NR	NR	NR	NR	NR
Furadan 15G	NR	NR	**	NR	NR	NR	NR	NR
Imidan 50WP	NR	NR	14	NR	NR	NR	NR	7
Lannate 1.8L	1	3	0	1-3	1	NR	1-3	8
Lorsban 4E	NR	NR	35	NR	*	NR	NR	NR
Malathion EC	1-5	3	5	1	7	14	1	3
Metasystox-R 2SC	NR	**	7-21	**	7	NR	21	NR
Parathion 8E (ethyl)	10	15	12	15	10	21	15	14
Penncap-M	15	NR	3	NR	21	NR	15	14
Pounce 3.2EC	NR	3	1	NR	1	1	NR	***
Pydrin 2.4EC	1	7	1	3	3	NR	3	21
Sevin 80S, XLR Plus	0	0	0	0	3	14	0	1
Thimet 20G	NR	NR	*	NR	NR	NR	*60	NR

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

SOME SUGGESTED FIELD RE-ENTRY PERIOD

Re-entry periods may be listed on the label. FOLLOW LABEL DIRECTIONS AND DO NOT ENTER FIELDS AFTER TREATMENT UNTIL THE RE-ENTRY PERIOD HAS PASSED.

Ambush 2E - When spray is dry
Asana 1.9EC - When spray is dry
Comite 6.5EC - When spray is dry
Counter 15G - 7 days (foliar)
- After dust settled (soil)
Cygon 400 - 4 days
Diazinon AG500 - When spray is dry
Diazinon 14G - After dust settled
Dipel 10G, ES - When dust settles
or spray is dry
Di-Syston 8EC, 15G - 24 hrs
Dyfonate II 20G - 24 hrs (foliar)
- After dust settled (soil)
4EC - 24 hrs
Dylox 80S - When spray is dry
EPN 5EC - 24 hrs
Furadan 15G - None stated on label
Furadan 4F - 24 hrs (limited activity in fields)
- 14 days (prolonged activity in fields)
Guthion 50WP - 24 hrs
Imidan 50WP - When spray is dry
Lannate 1.8L, 90S - When spray is dry
Larvin 3.2F - When spray is dry
Lorsban 4E - 24 hrs
15G - None stated on label
Malathion EC - When spray is dry
Metasystox-R 2E - 48 hrs
Parathion (ethyl and methyl) - 48 hrs
Penncap-M - 48 hrs
Pounce 3.2EC - When spray is dry
Pydrin 2.4EC - When spray is dry
Sevin, all formulations - When spray is dry
Thimet 20G - 7 days (foliar)
- After dust settled (soil)

CONTAINER DISPOSAL

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

Paper Bags: Be certain that 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) where such burning is not in violation of 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 3 times with water and dump rinse material into tanks to be used with regular applications. Recycle 5 gallon or larger metal drums where possible after complete rinsing. Containers that cannot be recycled should be punctured, crushed, and buried in a landfill or 24 inches below the soil surface in a location that will not result in contamination of water, crops, man, or animals.

ABBREVIATIONS

AI/A - Active Ingredient Per Acre; Form - Formulation; LS - Liquid Solution; E - Emulsifiable; G - Granular; oz - Ounce; EC - Emulsifiable Concentrate; L - Liquid; S - Soluble; ES - Emulsifiable Suspension; lb - Pound; SP - Soluble Powder; F - Flowable; LC - Liquid Concentrate ; WP - Wettable Powder.

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. Major insect pests of beets are the sugarbeet webworm, root maggots, armyworms, cutworms, and flea beetles.

Germinating and young seedling sugarbeets are sensitive to the presence of insecticides alone and possibly in combination with herbicides. All of the 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. Even with these precautions phytotoxicity may occur. Because of the potential for significant stand loss, planting-time insecticides should be used on sugarbeets only when absolutely necessary to control damaging insect populations.

REGISTERED FOR CONTROL OF SUGARBEET INSECTS

Rate is active ingredient per acre unless otherwise noted.

Insect	Insecticide	Rate	Restrictions and Comments
Aphids	aldicarb (R) (Temik 15G)	1.0-2.0 lb	Use of this product is not recommended due to the possibility of ground water contamination. Excess irrigation or rainfall, 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. Drill granules 1 to 3 inches below seed line. Granules can be placed with seed if rate does not exceed 7 lb form per acre.
	disulfoton (R) (Di-Syston 8EC)	1.0 lb	Do not apply directly to seed. Appy no more than 3 times/season. 30 day harvest restriction. Minimum 21 days between applications. IMPORTANT - Read label! (planting or sidedress).
	(R) (Di-Syston 15G)	6 oz form*	Do not apply directly to seed. Apply no more than 3 times/season. 30 day harvest restriction. Minimum 21 days between applications. IMPORTANT - Read label!
	malathion 57EC	1.0-1.25 lb	Wait 7 days before harvest if tops are to be used for feed.
	oxydemeton-methyl (Metasystox-R)	0.37-0.75 lb	Do not apply more than 6 times/season. Wait 30 days before using either beets or beet tops for feed or forage.
	(R) parathion 4EC	0.5 lb	Wait 15 days before harvest.
	phorate (R) (Thimet 20G)	4.5 oz form**	Do not place granules in direct contact with seed. Wait 30 days before harvest. Do not feed tops or silage to dairy cattle. See label.
	(R) (Thimet 20G)	4.9-7.5 lb form*	POSTEMERGENCE APPLICATION. Same restrictions as above. May be applied by air.
Armyworms	carbaryl (Sevin XLR Plus, 80S)	1.5 lb	Wait 14 days before harvest.
	(Sevin 5% bait)	2.0 lb form*	Wait 14 days before harvest.
	(R) parathion	0.5 lb	Wait 15 days before harvest.
Beet Armyworm	aldicarb (R) (Temik 15G)	1.5-2.1 lb	Use of this product is not recommended due to the possibility of ground water contamination. Excess irrigation or rainfall, 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. Apply granules in a 2-4 inch band over seed row. Immediately work into the soil or cover with soil, or where irrigation is employed, drill granules 2 inches deep and 2 inches to side of seed row on water furrow side.
	chlorpyrifos (Lorsban 4E)	0.75-1.0 lb	Wait 30 days before harvest. Apply only 8 pints total per season.
	methomyl (R) (Lannate L)	0.5 lb	Wait 7 days before harvest, 30 days before grazing tops.

REGISTERED FOR CONTROL OF SUGARBEET INSECTS - CON'T.

Rate is active ingredient per acre unless otherwise noted.

Insect	Insecticide	Rate	Restrictions and Comments
Beet Root Maggot	carbofuran (R) (Furadan 15G)	9 oz form*	7 inch band over the row at planting. Apply as modified in-furrow application. See label.
	chlorpyrifos (Lorsban 15G)	4.5-9.0 oz form* (in-furrow) 6.5-9.0 oz form* (band or T-band)	Apply planting treatment in front of press wheel. Incorporate postemergence treatment 1/2 inch to 1 inch. Do not make more than one application.
	diazinon14G	6-8 oz form*	Planting Treatment: Apply 8 oz of formulation ahead of press wheel in a 5-7 inch band. Do not apply in direct contact with seed. Postplant Treatment: Apply 6 oz of formulation as 5-7 inch band as postemergence treatment.
	fonofos (R) (Dyfonate II 20G)	5.0 to 7.5 lb form/A	Apply in 7 inch band over row at planting. Lightly incorporate. Do not place in direct contact with seed.
	(Dyfonate 10G)	10-15 lb form/A	See above.
	phorate (R) (Thimet 20G)	4.5 oz form*	Do not place in contact with seed. Apply at planting.
	terbufos (R) (Counter 15G)	4-8 oz form**	One application/year. May be used at planting or postemergence. Do not place in contact with seed.
Beet Root Maggot Adults	malathion ULV 9.33	0.6 lb	No harvest restriction. Wait 7 days before grazing tops.
Cutworms	chlorpyrifos (Lorsban 15G)	6.5-9.0 oz form*	Apply at planting as 5 inch band in front of press wheel. Incorporate treatment 1/2 inch to 1 inch. Only one application per year.
	(Lorsban 4E)	1.0 lb	Wait 30 days before harvest or grazing. Apply only 8 pints total/season.
Flea Beetle Adults	(R) parathion 4EC	0.5 lb	Wait 15 days before harvest.
	carbaryl (Sevin XLR Plus, 80S)	1.0-1.5 lb	Wait 14 days before harvest.
Grasshoppers	carbaryl (Sevin XLR Plus, 80S)	1.5 lb	Wait 14 days before harvest.
	diazinon AG500	0.5 lb	Wait 7 days before harvest.
	malathion 57EC	1.875 lb	Wait 7 days before grazing tops.
	malathion ULV 9.33	0.6 lb	No harvest restriction. Wait 7 days if tops are used for feed.
	(R) parathion	0.5 lb	Wait 15 days before harvest.
Leafhoppers	aldicarb (R) (Temik 15G)	1.5-2.1 lb	Use of this product is not recommended due to the possibility of ground water contamination. Excess irrigation or rainfall, 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. Drill granules 1-3 inches below seed line. Granules can be placed in seed furrow if rate does not exceed 7 lb form per acre.
	carbaryl (Sevin XLR Plus, 80S)	1.5 lb	Wait 14 days before harvest.
	diazinon AG500, 50W	0.5 lb	No restrictions listed on label.
	disulfoton (R) (Di-Syston 8EC)	1.0 lb	Wait 30 days before harvest.
	naled (Dibrom 8EC)	1.0 lb	Wait 5 days before harvest.
	oxydemeton-methyl (Metasystox-R)	0.75 lb	Wait 30 days before harvest.
	phorate (R) (Thimet 20G)	4.5 oz form**	Drill granules to side of seed or band granules over the row. Do not place granules in direct contact with seed. 30 day harvest restriction. Do not feed tops to livestock.
Symphylans and Wireworms	diazinon 14G	21-28 lb form/A	Wireworms only. Apply prior to planting; broadcast and incorporate 4-8 inches deep.
	diazinon AG500	3-4 lb	Wireworms only. Apply prior to planting; incorporate 4-8 inches deep.

REGISTERED FOR CONTROL OF SUGARBEET INSECTS - CON'T.

Rate is active ingredient per acre unless otherwise noted.

Insect	Insecticide	Rate	Restrictions and Comments
Symphylans and Wireworms	fonofos (R) (Dyfonate 4EC)	4 lb	Broadcast prior to planting and incorporate.
	(Dyfonate 10G)	40 lb form/A	Broadcast prior to planting and incorporate.
	terbufos (R) (Counter 15G)	4-8 oz**	Wireworms only. Apply in band over the row at planting and incorporate. Do not place in direct contact with seed. One application per year.
Webworms	carbaryl (Sevin 50WP, 80S, XLR Plus)	1.5 lb	Wait 14 days before harvest.
	methomyl (R) (Lannate L)	0.5 lb	Wait 7 days before harvest, 30 days before grazing tops.
	(R) parathion 4EC	0.5 lb	Wait 15 days before harvest.

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

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

DRY BEAN INSECTS

(NebGuide G86-786)

The dry bean growing area of Nebraska lies primarily in the Panhandle and in the southwest. Major insect pests are the western bean cutworm and the Mexican bean beetle.

RECOMMENDATIONS FOR CONTROL OF DRY BEAN INSECTS

Rate is active ingredient per acre unless otherwise noted.

Insect	Insecticide	Rate	Restrictions and Comments
Aphids	azinphos-methyl (R) (Guthion 2S)	0.37-0.5 lb	Apply specified dosage by air or ground equipment in sufficient water for complete coverage but not less than 1 gallon per acre. Do not apply to dry beans within 30 days of harvest. Do not exceed 4 applications/season. Do not feed or ensile treated forage.
	diazinonAG500	0.5 lb	Wait 7 days before harvest.
	dimethoate (Cygon 400)	0.25-0.5 lb	No waiting period for harvest of beans. Do not feed treated vines.
	disulfoton (R) (Di-Syston 8EC)	1.0 lb	Wait 60 days before harvest. Apply in a 6 to 8 inch band and lightly incorporate. Avoid seed contact.
	esfenvalerate (R) (Asana 1.9EC)	0.025-0.05 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.
	fenvalerate (R) (Pydrin 2.4EC)	0.1-0.2 lb.	Repeat as necessary. Pea aphid only. Do not exceed 0.8 lb AI/acre per season. Do not graze livestock on treated vines.
	malathion 57EC	1.0 lb	Wait 1 day before harvest.
	methyl parathion (R) (Penncap-M)	0.5 lb	To avoid injury to bees, do not apply during the period from 7 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)	1.0 lb	Wait 4 days before harvest.
	(R) parathion 4EC	0.5 lb	Wait 15 days before harvest.
	phorate (R) (Thimet 20G)	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.
Grasshoppers	carbaryl (Sevin 80S, XLR Plus)	2.0 lb	No restrictions.
	dimethoate (Cygon 400)	0.25-0.5 lb	No waiting period for harvest of beans. Do not feed treated vines to livestock.
	esfenvalerate (R) (Asana 1.9EC)	0.025-0.05 lb	Repeat as necessary to maintain control. Do not exceed 0.2 lb AI/acre per season. Do not feed or graze livestock on treated vines. Wait 21 days before harvest.
	fenvalerate (R) (Pydrin 2.4EC)	0.1-0.2 lb	Repeat as necessary to maintain control. Do not exceed 0.8 lb AI/acre per season. Do not feed or graze livestock on treated vines. Wait 21 days before harvest.

RECOMMENDATIONS FOR CONTROL OF DRY BEAN INSECTS - CON'T.

Rate is active ingredient per acre unless otherwise noted.

Insect	Insecticide	Rate	Restrictions and Comments
Leafhoppers	carbaryl (Sevin 80S, XLR Plus)	2.0 lb	No restrictions.
	dimethoate (Cygon 400)	0.25-0.5 lb	No waiting period for harvest of beans. Do not feed treated vines.
	(R) esfenvalerate (Asana 1.9EC)	0.025-0.05 lb	Repeat as necessary to maintain control. Do not exceed 0.2 lb AI/acre per season. Do not feed or graze livestock on treated vines. Wait 21 days before harvest.
	(R) fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb	Repeat as necessary to maintain control. Do not exceed 0.8 lb AI/acre per season. Do not feed or graze livestock on treated vines. Wait 21 days before harvest.
	malathion 57EC	1.25 lb	Wait 1 day before harvest.
	malathion ULV 9.33	0.6 lb	Wait 1 day before harvest.
	(R) methyl parathion (Penncap-M)	0.5 lb	To avoid injury to bees, do not apply during the period from 7 days prior to first bloom through peak bloom. After this time, apply to beans as long as bees are not actively visiting area. Do not apply within 15 days of harvest.
	(R) phorate (Thimet 20G)	4.5-7.0 oz form**	Drill granules to side of seed at planting. Do not place in direct contact with seed. Do not feed foliage of treated beans within 60 days of treatment.
Mexican Bean Beetle	PREPLANT - TREAT IF BEETLES WERE A PROBLEM THE PREVIOUS SEASON.		
	(R) disulfoton (Di-Syston 15G)	1.0 lb or 6 oz form*	Wait 60 days. Apply in a band (lightly incorporate) or sidedress. Avoid seed contact.
	(R) (Di-Syston 8EC)	1.0 lb	Wait 60 days. Apply in a 6 to 8 inch band and lightly incorporate.
	(R) phorate (Thimet 20G)	4.5-9.4 oz form**	Drill granules to the side of seed at planting. Do not place in direct contact with seed. Do not feed foliage of treated beans within 60 days of treatment.
	FOLIAR - TREAT IF EGG MASSES ON UNDERSIDES OF LEAVES AVERAGE 1 OR MORE PER 6 PLANTS.		
	(R) azinphos-methyl (Guthion 2S)	0.5 lb	Apply specified dosage by air or ground in sufficient water for complete coverage but not less than 1 gallon per acre. Repeat as necessary. Do not apply to dry beans within 30 days of harvest. Do not exceed 4 applications on dry beans. Do not feed or ensile treated forage.
	carbaryl (Sevin 80S, XLR Plus)	0.5 lb	No restrictions.
	dimethoate (Cygon 400)	0.25-0.5 lb	No waiting period for harvest of beans. Do not feed treated vines.
	(R) esfenvalerate (Asana 1.9EC)	0.125-0.025 lb	Repeat as necessary to maintain control. Do not exceed 0.2 lb AI/acre per season. Do not feed or graze livestock on treated vines. Wait 21 days before harvest.
	(R) fenvalerate (Pydrin 2.4EC)	0.05-0.1 lb	Repeat as necessary to maintain control. Do not exceed 0.8 lb AI/acre per season. Do not graze livestock on treated vines.
	malathion 57EC	1.0-1.25	Wait 1 day before harvest.
	malathion ULV 9.33	0.6 lb	Wait 1 day before harvest.
	(R) methomyl (Lannate L)	0.5 lb	Wait 25 days before harvest.
	(R) methyl parathion (Penncap-M)	0.5 lb	To avoid injury to bees, do not apply during the period from 7 days prior to first bloom through peak bloom. After this time, Penncap-M may be applied to beans as long as bees are not actively visiting the area. Do not apply within 15 days of harvest.
	trichlorfon (Dylox 80SP)	1.0-1.5 lb	Apply specified dosage per acre using sufficient water for complete coverage but not less than 1 gallon per acre. Repeat as necessary. Do not apply within 14 days of harvest.
Western Bean Cutworm	carbaryl (Sevin 80S, XLR Plus)	1.0 lb	No restrictions.
	(R) esfenvalerate (Asana 1.9EC)	0.025-0.05 lb	Repeat as necessary to maintain control. Do not exceed 0.2 lb AI/acre per season. Do not feed or graze livestock on treated vines. Wait 21 days before harvest.

RECOMMENDATIONS FOR CONTROL OF DRY BEAN INSECTS - CON'T.

Rate is active ingredient per acre unless otherwise noted.

Insect	Insecticide	Rate	Restrictions and Comments
Western Bean Cutworm	fenvalerate (R) (Pydrin 2.4EC)	0.1 - 0.2 lb	Repeat as necessary to maintain control. Do not exceed 0.8 lb AI acre per season. Do not feed or graze livestock on treated vines.
	trichlorfon (Dylox 80SP)	0.5-1.0 lb	Apply specified dosage per acre using sufficient water for complete coverage but not less than 1 gallon per acre. Repeat as necessary. Do not apply within 14 days of harvest.

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

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

SUNFLOWER INSECTS

(NebGuide G80-498)

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, adherance to established economic thresholds (which will vary depending on whether sunflowers are grown for oil or seed (confectionary)), and proper timing of insecticide applications.

SPRAYING BLOOMING SUNFLOWERS CAN BE EXTREMELY HAZARDOUS TO BEES. COORDINATE 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. 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. The majority of eggs are laid on the third day after the onset of bloom, and up to 90% are laid within 7 days after onset of bloom. If moth flights are not synchronized with the early bloom of the sunflowers, damage will be minimized. Planting after June 1 will reduce the potential for head moth damage. Controls are directed at the adult moths to prevent egg laying. Insecticides must be applied at early bloom (first ray flowers visible) for acceptable results. Scout and treat for the sunflower moth in the evening when moths are most active. Consider treatment if 1-2 adults are found per 5 plants.

REGISTERED FOR CONTROL OF SUNFLOWER MOTH ON SUNFLOWERS

Insecticide	Rate AI/Acre	Restrictions and Comments
carbofuran (R) (Furadan 4F)	0.5 lb	Do not apply within 28 days of harvest. Do not apply more than 4 times per season.
chlorpyrifos (Lorsban 4E)	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.
endosulfan (Thiodan 50WP)	1.0 lb	No harvest restriction. Do not exceed 3 applications. Do not feed treated forage to livestock.
(R) ethyl parathion 8E, 8F	0.5-1.0 lb	Do not apply within 30 days of harvest. No more than 3 applications per season (at least 5 days apart).
fenvalerate (R) (Pydrin 2.4EC)	0.1-0.2 lb	Do not apply within 28 days of harvest. Do not exceed 0.8 lb/AI per acre per season.
methidathion (R) (Supracide 2E)	0.5 lb	Do not apply within 50 days of harvest. No more than 3 applications per season at least 7 days apart. Do not graze treated areas or feed treated forage to livestock.
(R) methyl parathion	1.0 lb	Do not apply within 30 days of harvest. No more than 3 applications per season (at least 5 days apart). Do not feed seeds to birds.

CUTWORMS

Predominant species include 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. Treatment of cutworms on sunflowers should be considered if 20 percent or more of the plants are cut or show feeding damage and cutworms are less than 3/4 inch in length.

REGISTERED FOR CONTROL OF CUTWORMS ON SUNFLOWERS

Insecticide	Rate AI/Acre	Restrictions and Comments
carbaryl (Sevin 80S, XLR Plus)	1.5 lb	Do not apply within 60 days of harvest. Do not allow livestock to graze in treated areas.
chlorpyrifos (Lorsban 4E)	1.0-1.5 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.
fenvalerate (R) (Pydrin 2.4EC)	0.1-0.2 lb	Do not apply within 28 days of harvest. Do not exceed 0.8 lb AI per acre per season.

Chlorpyrifos is also registered for preplant incorporation (Lorsban 4E) and planting time applications (Lorsban 15G) for control of cutworms.

SEED WEEVILS

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 during late bloom in the newly developing seeds and the C-shaped, legless larvae feed in the seed. Control is directed at the adults to prevent egg laying. Treatment should be considered if 10-12 (oil) or 1-3 (confectionary) adults are found per plant when 85-100% of the plants are blooming.

REGISTERED FOR CONTROL OF SEED WEEVILS ON SUNFLOWERS

Insecticide	Rate AI/Acre	Restrictions and Comments
carbofuran (R) (Furadan 4F)	0.5 lb	Do not apply within 28 days of harvest. Do not apply more than 4 times per season.
chlorpyrifos (Lorsban 4E)	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.
fenvalerate (R) (Pydrin 2.4EC)	0.1-0.2 lb	Do not apply within 28 days of harvest. Do not exceed 0.8 lb AI per acre per season.
methidathion (R) (Supracide 2E)	0.5 lb	Do not apply within 50 days of harvest. No more than 3 applications per season (at least 7 days apart). Do not graze treated areas or feed treated forage to livestock.
(R) methyl parathion	1.0 lb	Do not apply within 30 days of harvest. No more than 3 applications per season (at least 5 days apart). Do not feed seeds to birds.

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. Eggs are laid in and larvae feed in the lower stalk, which may cause lodging. Control is primarily directed at the adult weevils. Treat if 2 adults are found per plant at the 14-leaf to early bud stage.

REGISTERED FOR CONTROL OF STEM WEEVIL ON SUNFLOWERS

Rate is active ingredient per acre unless otherwise noted.

Insecticide	Rate	Restrictions and Comments
carbaryl (Sevin 80S, XLR Plus)	1.0-2.0 lb	Do not apply within 60 days of harvest. Do not allow livestock to graze in treated areas.
carbofuran (R) (Furadan 4F)	0.5 lb	Do not apply within 28 days of harvest. Do not apply more than 4 times per season.
(R) (Furadan 15G)	8-16 oz form*	Apply at planting. 7 inch band or in-furrow.
chlorpyrifos (Lorsban 4E)	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.
fenvalerate (R) (Pydrin 2.4EC)	0.1-0.2 lb	Do not apply within 28 days of harvest. Do not exceed 0.8 lb AI per acre per season.
methidathion (R) (Supracide 2E)	0.5 lb	Do not apply within 50 days of harvest. No more than 3 applications per season (at least 7 days apart). Do not graze treated areas or feed treated forage to livestock.

* Rate is formulation per 1,000 row feet.

SUNFLOWER BEETLE

The sunflower beetle is cream colored with 3 dark stripes on each wing cover. The head is reddish- brown. These 1/4-3/8 inch long beetles 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. Treatment should be considered if 1-2 adults or 10-15 larvae are found per seedling.

REGISTERED FOR CONTROL OF SUNFLOWER BEETLE ON SUNFLOWERS

Insecticide	Rate AI/Acre	Restrictions and Comments
carbaryl (Sevin 80S, XLR Plus)	1.0-2.0 lb	Do not apply within 60 days of harvest. Do not allow livestock to graze in treated areas.
carbofuran (R) (Furadan 4F)	0.125-0.25 lb	Do not apply within 28 days of harvest. Do not apply more than 4 times per season.
chlorpyrifos (Lorsban 4E)	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.
fenvalerate (R) (Pydrin 2.4EC)	0.05-0.1 lb	Do not apply within 28 days of harvest. Do not exceed 0.8 lb AI per acre per season.

Carbofuran (R) (Furadan 15G) is also registered for a planting time application at 16 oz form per 1,000 feet of row in a 7 inch band or in-furrow.

GRASSHOPPERS

(G86-791)

Treatment for grasshoppers in sunflowers should be considered if 8 or more are found per square yard and/or 25% defoliation has occurred.

REGISTERED FOR CONTROL OF GRASSHOPPERS ON SUNFLOWERS

Insecticide	Rate AI/Acre	Restrictions and Comments
carbaryl (Sevin 80S, XLR Plus)	1.0-1.5 lb	Do not apply within 60 days of harvest. Do not allow livestock to graze in treated areas.
carbofuran (R) (Furadan 4F)	1.125-0.5 lb	Do not apply within 28 days of harvest. Do not apply more than 4 times per season.
chlorpyrifos (Lorsban 4E)	0.5 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.
fenvalerate (R) (Pydrin 2.4EC)	0.1-0.2 lb	Do not apply within 28 days of harvest. Do not exceed 0.8 lb AI per acre per season.

Carbofuran (R) (Furadan 15G) is also registered for a planting time application at 8-16 oz form per 1,000 feet of row in a 7 inch band or in-furrow.

REGISTERED FOR CONTROL OF GRASSHOPPERS IN NON-CROP AND WASTE AREAS

Rates are active ingredient per acre unless otherwise noted.

acephate (Orthene 75S)	0.125-0.5 lb
carbaryl (Sevin 80S, XLR Plus, Sevin 4-Oil)	0.5-1.5 lb
diazinon AG500	0.5-1.5 lb
(R) esfenvalerate (Asana 1.9EC)	0.025-0.05 lb
(R) fenvalerate (Pydrin 2.4EC)	0.05-0.1 lb
malathion ULV 9.33	8-12 fl oz form/Acre

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. Control guidelines have not been established for this insect and no insecticides are specifically registered for its control.

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 EC89-1511 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.

REGISTERED FOR CONTROL OF INSECTS ON VETCH

Insect	Insecticide	Rate AI/Acre	Restrictions and Comments
Armyworms	(R) ethyl parathion 4EC, 8E, 8F	0.25-0.50 lb	Wait 15 days before harvest.
Pea Aphid	(R) ethyl parathion 4EC, 8E, 8F	0.25-0.5 lb	Wait 15 days before harvest.
	malathion 57EC	1.0-1.25 lb	No harvest restrictions.
Vetch Bruchid	malathion 57EC	1.0-1.25 lb	Pre-bloom only. No waiting period. Apply when temperatures are 60° F or higher. Apply insecticides to kill adults before they lay eggs. This should be done as the first pods appear in the fields.
	(R) methyl parathion 4E	0.5 lb	Pre-bloom only.

POTATO INSECTS

(G79-452, G79-454)

Even minor feeding injury on potato tubers can leave them unmarketable. This increases the importance of routine insect scouting that will assist in determining when threatening pest infestations are present.

SOIL INSECTS

CUTWORMS

Cutworms species known to damage potatoes include black, dingy, and dark-sided cutworms.

REGISTERED FOR CONTROL OF CUTWORMS ON POTATOES

Insecticide	Rate AI/Acre	Restrictions and Comments
carbaryl (Sevin 80S, XLR Plus)	2.0 lb	No harvest restriction.
diazinon AG500, 50W, 14G	2.0-4.0 lb	Wait 35 days before harvest.
esfenvalerate (R) (Asana 1.9EC)	0.025-0.05 lb	Do not graze livestock on treated vines. Do not exceed 0.35 lb AI/A per season. Wait 7 days before harvest.
fenvalerate (R) (Pydrin 2.4EC)	0.1 - 0.2 lb	Do not graze livestock.
methamidophos (R) (Monitor 4)	0.75-1.0 lb	Wait 14 days before harvest.
permethrin (R) (Pounce 3.2EC, 25WP)	0.1-0.2 lb	Wait 7 days before harvest.

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.

REGISTERED FOR CONTROL OF FLEA BEETLE LARVAE ON POTATOES

Rate is active ingredient per acre unless otherwise noted.

	Insecticide	Rate	Restrictions and Comments
(R)	aldicarb (Temik 15G)	14.5-23 oz form*	Use of this product is not recommended due to the possibility of ground water contamination. Excess irrigation or rainfall, 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. Apply at planting according to label directions. Wait 90 days before harvest. Use lower rate for lighter soils and higher rate for heavier soils.
	carbaryl (Sevin XLR Plus)	0.5-1.0 lb	No harvest restrictions.
(R)	carbofuran (Furadan 15G)	24 oz form*	Apply into furrow during planting.
(R)	disulfoton (Di-Syston 15G)	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.
(R)	esfenvalerate (Asana 1.9EC)	0.025-0.05 lb	Repeat as necessary to maintain control. Do not graze livestock on treated vines. Do not exceed 0.35 lb AI/Acre per season. Wait 7 days before harvest.
(R)	fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb	Wait 7 days before harvest. Do not feed or graze treated foliage.
(R)	permethrin (Pounce 3.2EC, 25WP Ambush 2E, 25W)	0.1-0.2 lb	Wait 7 days before harvest. Do not feed or graze treated foliage.
(R)	phorate (Thimet 20G)	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.

WIREWORMS

Wireworms are difficult insects to control. Damage is most likely when potatoes are planted following sod.

These hard-bodied, slender brown larvae bore into underground stems causing the young plants to wither and die. Damaged tubers typically show long slender tunnels.

REGISTERED FOR CONTROL OF WIREWORMS ON POTATOES

Rate is active ingredient per acre unless otherwise noted.

	Insecticide	Rate	Restrictions and Comments
	diazinon AG500	0.75-1.5 lb	Preplant broadcast application; incorporate immediately 4-8 inches deep by disk or harrow.
(R)	ethoprop (Mocap 10G)	2.5 oz form*	Band application at planting. See label if broadcast.
(R)	(Mocap 6EC)	3.0 lb	Band application at planting. See label if broadcast.
(R)	fensulfothion (Dasanit 15G)	5.0 lb	Preplant broadcast, incorporate 3-4 inches.
(R)	fonofos (Dyfonate 4EC)	4.0 lb	Preplant broadcast application - incorporate into the top 3-4 inches by disking.
	(Dyfonate 10G)	4.0 lb	Preplant broadcast application - incorporate into the top 3-4 inches by disking.
(R)	phorate (Thimet 20G)	11.3-17.3 oz form*	Band application or in-furrow at planting. Lower rate is for sandy soils. Wait 90 days before harvest.

* Rate per 1,000 row feet.

FOLIAR INSECTS

RECOMMENDATIONS FOR CONTROL OF FOLIAR INSECTS ON POTATOES

Rate is active ingredient per acre unless otherwise noted.

Insect	Insecticide	Rate	Restrictions and Comments
Aphids: Buckthorn, Green Peach, or Potato	diazinon AG500, 50W	0.25-0.375 lb	Wait 35 days before harvest
	dimethoate (Cygon 400)	0.5 lb	No harvest restrictions.
	(R) esfenvalerate (Asana 1.9EC)	0.025-0.05 lb	Do not graze livestock on treated vines. Do not exceed 0.35 lb AI/A per season. Wait 7 days before harvest.
	(R) fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb	Do not graze livestock on treated vines.
	malathion 57EC	1.25 lb	No harvest restrictions.
	(R) methamidophos (Monitor 4)	1.0 lb	Wait 14 days before harvest. Do not graze livestock.
	(R) permethrin (Ambush 2E & 25W)	0.05-0.2 lb	Wait 7 days before harvest.
	(R) phorate (Thimet 20G)	11.3-17.3 oz form*	Band or in-furrow at planting. Use lower rate for sandy soils. Apply 90 days before harvest.
Armyworm	carbaryl (Sevin 80S, XLR Plus)	2.0 lb	No harvest restrictions.
	(R) esfenvalerate (Asana 1.9EC)	0.025-0.05 lb	Do not graze livestock on treated vines. Do not exceed 0.35 lb AI/A per season. Wait 7 days before harvest.
	(R) fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb	See label. Do not graze livestock.
	(R) methamidophos (Monitor 4)	0.75-1.0 lb	Do not graze livestock.
	(R) permethrin (Pounce 3.2EC, 25WP)	0.1-0.2 lb	Wait 7 days before harvest. Do not graze or feed potato foliage
Colorado Potato Beetle	carbaryl (Sevin 80S, XLR Plus)	1.0 lb	No harvest restrictions.
	(R) carbofuran (Furadan 4F)	0.5-1.0 lb	Apply 14 days before harvest. Apply by ground equipment only.
	diazinon AG500, 50W	0.25-0.375 lb	Wait 35 days before harvest.
	endosulfan (Thiodan 50WP)	1.0 lb	Do not follow potatoes with root crops other than carrots, potatoes, sugarbeets, or sweet potatoes.
	(R) esfenvalerate (Asana 1.9EC)	0.0125-0.025 lb	Do not graze livestock on treated vines. Do not exceed 0.35 lb AI/A per season. Wait 7 days before harvest.
	(R) fenvalerate (Pydrin 2.4EC)	0.05-0.1 lb	Do not graze livestock.
	(R) methamidophos (Monitor 4)	0.75-1.0 lb	Do not graze livestock.
	(R) methyl parathion (Penncap-M)	0.5-1.5 lb	Wait 5 days before harvest.
	(R) permethrin (Ambush 2E, 25W)	0.05-0.2 lb	Wait 7 days before harvest.
	(R) (Pounce 3.2EC, 25WP)	0.1-0.2 lb	Wait 7 days before harvest. Do not graze livestock.
	(R) phorate (Thimet 20G)	17.3 oz form*	Band or in-furrow at planting. Heavy or clay soils only (early season control). Wait 90 days before harvest.
	phosalone (Zolone 3EC)	0.5-1.5 lb	Do not graze livestock. Do not tank mix with disulfoton.
	phosmet (Imidan 50WP)	1.0 lb	Wait 7 days before harvest.
European Corn Borer	(R) azinphos-methyl (Guthion 50WP)	0.5 lb	Wait 7 days before harvest.

RECOMMENDATIONS FOR CONTROL OF FOLIAR INSECTS ON POTATOES - CON'T.

Rate is active ingredient per acre unless otherwise noted.

Insect	Insecticide	Rate	Restrictions and Comments
European Corn Borer	carbaryl (Sevin 80S, XLR Plus)	2.0 lb	No harvest restrictions.
	carbofuran (R) (Furadan 15G)	1.5 lb	Apply to seed furrow during planting.
	(R) (Furadan 4F)	0.5-1.0 lb	Wait 14 days before harvest.
	esfenvalerate (R) (Asana 1.9EC)	0.025-0.05 lb	Do not graze livestock on treated vines. Do not exceed 0.35 lb AI/A per season. Wait 7 days before harvest.
	fenvalerate (R) (Pydrin 2.4EC)	0.1-0.2 lb	See label. Do not graze.
	methamidophos (R) (Monitor 4)	0.75-1.0 lb	Do not graze livestock.
	methyl parathion (R) (Penncap-M)	0.5-1.0 lb	Wait 5 days before harvest.
	permethrin (R) (Pounce 3.2EC, 25WP)	0.1-0.2 lb	Wait 7 days before harvest. Do not graze.
	phosalone (Zolone 3EC)	1.0 lb	Do not graze livestock. Do not tank mix with disulfoton.
Flea Beetle Adults	azinphos-methyl (R) (Guthion 2S)	0.75 lb	Wait 7 days before harvest.
	carbaryl (Sevin 80S, XLR Plus)	1.0 lb	No harvest restrictions.
	carbofuran (R) (Furadan 4F)	0.5-1.0 lb	Wait 14 days before harvest.
	endosulfan (Thiodan 50WP)	1.0 lb	Do not follow potatoes with root crops other than carrots, potatoes, sugarbeets, and sweet potatoes.
	esfenvalerate (R) (Asana 1.9EC)	0.025-0.05 lb	Do not exceed 0.35 lb AI/A/ season. Do not graze livestock on treated vines. Wait 7 days before harvest.
	fenvalerate (R) (Pydrin 2.4EC)	0.1-0.2 lb	Do not exceed 1.4 lb AI/acre/season. Do not graze livestock on treated vines.
	methamidophos (R) (Monitor 4)	0.75-1.0 lb	Wait 14 days before harvest.
	methyl parathion (R) (Penncap-M)	0.5-1.0 lb	Wait 5 days before harvest.
	permethrin (R) (Pounce 3.2EC, 25WP)	0.1-0.2 lb	Wait 7 days before harvest. No more than 12 applications/season. Do not graze.
	(R) (Ambush 2E, 25W)	0.05-0.2 lb	Wait 7 days before harvest.
	phosmet (Imidan 50WP)	1.0 lb	Wait 7 days before harvest.
Grasshoppers	carbaryl (Sevin 80S, XLR Plus)	1.5 lb	No harvest restrictions.
	dimethoate (Cygon 400)	0.25-0.5 lb	No harvest restrictions.
	esfenvalerate (R) (Asana 1.9EC)	0.025-0.05 lb	Do not graze livestock on treated vines. Do not exceed 0.35 lb AI/A per season. Wait 7 days before harvest.
	fenvalerate (R) (Pydrin 2.4EC)	0.1-0.2 lb	Do not feed or graze vines. Wait 7 days before harvest.
	malathion 57EC	1.25 lb	No harvest restrictions.
	methyl parathion (R) (Penncap-M)	0.5-1.0 lb	Wait 5 days before harvest.
Leafhoppers	carbaryl (Sevin 80S, XLR Plus)	1.5 lb	No harvest restrictions.
	carbofuran (R) (Furadan 4F)	0.5-1.0 lb	Wait 14 days before harvest. No more than 8 applications/season.
	diazinon AG500	0.375-0.5 lb	Wait 35 days before harvest.

RECOMMENDATIONS FOR CONTROL OF FOLIAR INSECTS ON POTATOES - CON'T.

Rate is active ingredient per acre unless otherwise noted.

Insect	Insecticide	Rate	Restrictions and Comments
Leafhoppers	dimethoate (Cygon 400)	0.5 lb	No harvest restrictions.
	esfenvalerate (R) (Asana 1.9EC)	0.025-0.05 lb	Do not graze livestock on treated vines. Do not exceed 0.35 lb AI/A per season. Wait 7 days before harvest.
	fenvalerate (R) (Pydrin 2.4EC)	0.1-0.2 lb	Do not graze livestock on treated vines.
	malathion 57EC	1.25 lb	No harvest restrictions.
	methyl parathion (R) (Penncap-M)	0.5-1.0 lb	Wait 14 days before harvest.
	permethrin (R) (Pounce 3.2EC, 25WP, Ambush 2E, 25W)	0.1-0.2 lb	Wait 7 days before harvest. Do not graze.
	phorate (R) (Thimet 20G)	11.3-17.3 oz form*	Band or in-furrow at planting. Lower rate is for sandy soils. Wait 90 days before harvest.
	phosmet (Imidan 50WP)	1.0 lb	Wait 7 days before harvest.
Potato Psyllid	carbaryl (Sevin 80WP)	2.0 lb	No harvest restrictions.
	disulfoton (R) (Di-Syston 8EC, 15G)	2.0-4.0 lb	Wait 75 days before harvest.
	endosulfan (Thiodan 50WP)	1.0 lb	Do not follow potatoes with root crops other than carrots, potatoes, sugarbeets and sweet potatoes.
	esfenvalerate (R) (Asana 1.9EC)	0.0125-0.025 lb	Do not graze livestock on treated vines. Do not exceed 0.35 lb AI/A per season. Wait 7 days before harvest.
	fenvalerate (R) (Pydrin 2.4EC)	0.05-0.1 lb	Do not graze livestock on treated vines. Do not exceed 1.4 lb AI/acre/season.
	permethrin (R) (Ambush 2E, 25W, Pounce 3.2EC, 25WP)	0.05-0.2 lb	Wait 7 days before harvest.
	phorate (R) (Thimet 20G)	11.3-17.3 oz form*	Band or in-furrow at planting. Lower rate is for sandy soils. Wait 90 days before harvest.

* Rate per 1,000 row feet.

ONION INSECTS

(NebGuide G76-304)

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.

REGISTERED FOR CONTROL OF INSECTS ON ONIONS

Rate is active ingredient per acre unless otherwise noted.

Insect	Insecticide	Rate	Restrictions and Comments
Onion Maggot	chlorpyrifos (Lorsban 4E)	1.1 fl. oz form*	Drench in-furrow. One application per year. Incorporate to depth of 1-2 inches.
	(Lorsban 15G)	3.7 oz form*	Apply in-furrow. One application per year.
	diazinon 14G	14-28 lb form/A	Broadcast prior to planting and incorporate 3-4 inches.
	diazinon 50W	2.0 lb	Apply at planting with sufficient water to drench seed furrow.
	diazinon AG500	1.0 lb	Apply at planting with sufficient water to drench seed furrow.
	fonofos (Dyfonate 10G)	1.0 lb	To be used on soils with greater than 10% organic matter.
	(R) (Dyfonate 4EC)	1.0 lb	To be used on soils with greater than 10% organic matter.
Onion Maggot Adults	malathion 57EC	1.5 to 2.5 pt form or 1.0-1.6 lb	Wait 3 days before harvest. Begin spraying when flies first appear and repeat every 10 to 14 days.

REGISTERED FOR CONTROL OF INSECTS ON ONIONS - CON'T.

Rate is active ingredient per acre unless otherwise noted.

Insect	Insecticide	Rate	Restrictions and Comments
Thrips	NOTE: Treatment for thrips in onions should be considered when 10-20 thrips per plant are observed. Adequate soil moisture will reduce the impact of the thrips. Treatment must give complete coverage to penetrate new growth. The potential exists for the presence of thrips resistant to organophosphate insecticides. If poor control is observed with these compounds a follow-up treatment with a carbamate should be considered.		
	azinphos-methyl (R) (Guthion 2S)	0.5-0.75 lb	Apply specified dosage by air or ground equipment in sufficient water to give complete coverage, but not less than 1 gallon per acre. Do not apply more than 3 times per season. Wait 7 (green onions) or 28 (dry onions) days before harvest.
	diazinon AG500, 50W	0.5 lb	Wait 10 days before harvest.
	malathion 57EC	1.0-1.25 lb	Wait 3 days before harvest.
	methomyl (R) (Lannate L)	0.45 lb	Add wetting agent. Wait 7 (dry onions) or 28 (green onions) days before harvest.
	methyl parathion (R) (Penncap-M)	0.5 lb	Wait 15 days before harvest.

*Rate per 1,000 row feet.