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EC87-1537 Field Crop Insect Control Guide for Nebraska

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FIELD CROP INSECT CONTROL GUIDE FOR NEBRASKA
Specialty Crops - Sugarbeets, Dry Beans, Sunflowers, Alfalfa Seed, Vetch, Potatoes, Onions

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Insect control 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 control 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, 104 ACB, University of Nebraska-Lincoln, NE 68583-0918) or from Cooperative Extension Service Offices.

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POLICY FOR MAKING PESTICIDE SUGGESTIONS

The choice of a pesticide should not be based entirely on its cost. Several other factors need to be considered in the decision, including efficacy against the target pest or pest combination, formulation of the pesticide, label restrictions, safety to non-target species (including humans) and environmental conditions at the time of application.

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 to be considered an endorsement by the Nebraska Cooperative Extension Service, and no discrimination is intended.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Leo E. Lucas, Director of Cooperative Extension Service, University of Nebraska, Institute of Agriculture and Natural Resources.

The Cooperative Extension Service provides information and educational programs to all people without regard to race, color, national origin, sex or handicap.

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. Liquid formulations of these products are not recommended for farmer application. However, farmers should be able to safely use granular formulations of these chemicals if they use proper precautions, 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 a <R>. Pesticides may be classified as Restricted Use based on their persistence, toxicity or potential environmental hazards. To purchase and use these products, EPA certification is required. Your local Cooperative Extension 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 chemical, be certain to ask the dealer if the attached label is up to date.

IMPORTANT

To keep updated on changes in pesticide registrations and informed of the latest developments on crop pests, subscribe to the Plant Disease, Weed, and Insect Newsletter. Full details and an order blank are given on the last page of this circular.

CONTROL DECISION GUIDELINES/ECONOMIC THRESHOLDS

Economic thresholds are flexible guidelines. They indicate the level of insect abundance that can be tolerated before control actions should be taken. THEY ARE NOT HARD RULES THAT APPLY TO EVERY SITUATION. Used conscientiously, they should be helpful in making treatment decisions. Many variables can affect your decision to treat including insect abundance, anticipated value of the crop, relative effectiveness of controls, and cost of the pesticide and its application. Timing and accuracy of application, plus 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, Revised August, 1984). The Nebraska Chemigation Act takes effect January 1, 1987. Consult your local Cooperative Extension Service office or Natural Resources District office before chemigating.

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 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. Other conservation tillage practices should result in a reduction in insect 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 do not observe manmade boundaries but will collect nectar and/or pollen wherever they can, including field crops such as corn, sorghum, soybeans and alfalfa. If bee colonies are nearby when fields 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 pests are abundant enough to justify it; 2) if possible, treat only when crops are not in bloom; 3) be certain that honeybee colonies are not directly sprayed with any insecticide; 4) check the crop for heavy concentration of blooming weeds; 5) spray only those parts of fields that have significant pest infestations; 6) if a reasonable choice is available, select an insecticide formulation that is less toxic to bees; and 7) time the application later in the evening when bees are not actively foraging.

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 vegetable or fruit. The following are some preharvest intervals (waiting periods). Check appropriate labels for any others. If you have questions regarding accidental treatments, 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	Broccoli	Apples
Ambush 2E	NR	3	1	NR	1	***
Counter 15G	NR	NR	30	NR	NR	NR
Cygon 400	7	0	NR	3	7	28
Diazinon AG500	1	5	0	7	5	NR
Diazinon 14G	**	**	**	**	**	NR
Dipel 2X	0	0	0	0	0	0
Di-Syston 8EC	30	NR	28	NR	14	NR
Di-Syston 15G	30	NR	40	NR	14	NR
Dyfonate 4EC	*	*	*	NR	*	NR
Dyfonate 20G	NR	NR	30	NR	*	NR
Furadan 4F	NR	NR	7	NR	NR	NR
Furadan 15G	NR	21	**	**	NR	NR
Imidan 50WP	NR	NR	14	NR	NR	7
Lannate 1.8L	1	3	0	1-3	3	8
Lorsban 4E	NR	NR	35	NR	30	NR
Malathion EC	1-5	3	5	1	3	3
Metasystox-R	NR	**	7-21	**	7	NR
Nudrin 1.8L	1	3	0	1-3	1-3	8
Parathion 8E (ethyl)	10	15	12	15	7	14
Penncap-M	15	NR	3	NR	NR	14
Pounce 3.2EC	0	3	1	NR	1	***
Pydrin 2.4EC	1	7	1	3	3	21
Sevin 80S	0	0	0	0	3	1
Thimet 20G	NR	NR	*	NR	NR	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 PERIODS

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.

Aastar 15G - 7 days
Ambush 2E - When spray is dry
Comite 6.5EC - 48 hrs
Counter 15G - 7 days
Cygon 400 - 48 hrs
Diazinon AG500 - When spray is dry
Diazinon 14G - Not stated on label
Dipel 10G, ES - 0 days
Di-Syston 8EC - 24 hrs, 15G - 7 days
Dyfonate 20G - 24 hrs
4EC - Not stated on label
Dylox 80SP - 0 days
EPN 4EC, 5EC - 24 hrs
Ethion EC - 24 hrs
ethyl parathion - 48 hrs
Furadan 4F - 14 days
15G - None stated on label
Guthion 50WP - 24 hrs
Imidan 50WP - None
Lannate 1.8L, 90SP - When spray is dry
Larvin 3.2F - When spray is dry
Lorsban 4E - 24 hrs
15G - Not stated on label
Malathion EC - 0 days
Metasystox-R - 48 hrs
methyl parathion - 48 hr
Nudrin 1.8L, 90SP - When spray is dry
Pay-Off 2.5EC - When spray is dry
Penncap-M - When spray is dry
Pounce 3.2EC - When spray is dry
Pydrin 2.4EC - When spray is dry
Sevin - All formulations, 0 days
Thimet 20G - 7 days

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.

RECOMMENDATIONS FOR CONTROL OF SUGARBEET INSECTS

Insect	Insecticide	Formulation or Rate AI/Acre	Restrictions and Comments
Aphids	aldicarb* <R> (Temik 15G)	1.0-2.0 lb	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 (at planting).
	disulfoton** <R> (Di-Syston 8EC)	1.0 lb	Do not apply directly to seed. 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./ 1,000 ft row (for any row spacing)	Do not apply directly to seed. Not 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 if tops are to be used for feed.
	methamidophos <R> (Monitor 4)	0.5-1.0 lb	Wait 30 days before harvest.
	oxydemeton-methyl (Metasystox-R)	0.37-0.75 lb	Do not apply more than 6 times/season. Wait 30 days before either using 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 of form./ 1,000 ft row (minimum 20 inch row spacing)	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)	1.0-1.5 lb	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	Wait 14 days before harvest.
	<R> parathion	0.5 lb	Wait 15 days before harvest.

Beet Armyworm	chlorpyrifos (Lorsban 4E)	0.75-1.0 lb	Wait 30 days before harvest. Apply only 8 pints total per season.
	methomyl <R> (Lannate L, Nudrin L)	0.5 lb	Wait 7 days before harvest, 30 days before grazing tops.
	trichlorfon (Dylox 80SP)	1.0 lb	Wait 14 days before harvest.
Beet Root Maggot	aldicarb* <R> (Temik 15G)	1.5 - 2.1 lb	Apply granules in a 2-4 inch band over seed row. Immediately work into the soil or cover with soil, OR where furrow irrigation is employed, drill granules 2 inches deep and 2 inches from seed row on water furrow side.
	carbofuran <R> (Furadan 15G)	9 oz form./ 1,000/ft row	7 inch band over the row at planting. Apply as modified in furrow application. See label.
	chlorpyrifos (Lorsban 15G)	4.5-9.0 oz (in furrow) 6.5-9.0 oz (band or T-band) form/ 1,000 ft of row	Apply planting treatment in front of press wheel. Incorporate postemergence treatment 1/2 inch to 1 inch. Do not make more than one application.
	diazinon 14G	6-8 oz form./ 1,000 ft row	Planting Treatment: Apply 8 oz form. 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.
	fensulfothion <R> (Dasanit 15G)	8 oz form./ 1,000 ft row	Apply in 4-6 inch band 1 inch above seed. Do not apply in direct contact with seed. On extremely narrow row spacings, do not place treated zones closer together than 6 inches.
	fonofos <R> (Dyfonate 20G)	5.0 to 7.5 lb	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.	See above.
	phorate <R> (Thimet 20G)	4.5 oz form./ 1,000 ft row	Do not place in contact with seed. Apply at planting.
	terbufos <R> (Counter 15G)	4-8 oz form./ 1,000 ft row (minimum 20 inch row spacing)	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./1,000 ft of row	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.
	trichlorfon (Dylox 80SP)	0.5-1.0 lb	Wait 14 days before harvest.
Flea Beetle Adults	<R> parathion 4EC	0.5 lb	Wait 15 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)	2-3 lb	Drill granules 1-3 inches below seed line. Granules can be placed in seed furrow if rate does not exceed 7 pounds per acre (at planting).
	carbaryl (Sevin XLR Plus, 80S)	1.5 lb	Wait 14 days before harvest.
	diazinon AG500, 50W	0.5 lb	No restriction listed.
	disulfoton** <R> (Di-Syston 8EC)	1.0 lb	Wait 30 days before harvest.
	naled (Dibrom)	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./ 1,000 ft row any row spacing (minimum 20 inch spacing)	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.
Soil Insects	diazinon 14G, AG500, 50W	3.0 lb	Broadcast and immediately work into the upper 6 inches.
Symphylans and Wireworms	diazinon 14G	21-28 lb of formulation	Apply prior to planting; incorporate at 4-8 inches.
	diazinon AG500	3-4 lb	Apply prior to planting; incorporate at 4-8 inches.
	fonofos <R> (Dyfonate 4EC)	4 lb formulation	Broadcast prior to planting and incorporate.
	(Dyfonate 10G)	40 lb formulation	Broadcast prior to planting and incorporate.
	terbufos <R> (Counter 15G)	4-8 oz/1,000 ft of row (minimum 20 inch row spacing)	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, Nudrin 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.
	trichlorfon (Dylox 80SP)	1.5 lb	Wait 14 days before harvest.

*With excess rainfall or irrigation, low pH (6 or lower), low temperature (less than 50° F), and low organic levels (under 1%), chemical breakdown is reduced and may cause residues to move deeper into the soil and possibly contaminate the groundwater.

**Do not plant any food or feed crop in rotation after a field treatment with disulfoton unless it is a registered use for disulfoton.

DRY BEAN INSECTS
(NebGuide G86-786)

The dry bean growing area of Nebraska lies primarily in the Panhandle and in the southwest, where irrigation is essential for successful production. Major insect pests are the western bean cutworm and the Mexican bean beetle.

RECOMMENDATIONS FOR CONTROL OF DRY BEAN INSECTS

Insect	Insecticide	Rate AI/Acre or Formulation When Noted	Restrictions and Comments
Aphids	azinphos-methyl <R> (Guthion 2S)	0.37-0.5 lb	Apply specified dosage per acre 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.
	demeton <R> (Systox 6E)	0.38-0.5 lb	Apply specified dosage by air or ground in sufficient water for coverage, but not less than 1 gallon per acre. Repeat as necessary but not more than 3 times per season nor within 30 days of harvest.
	diazinon AG500	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. 6 to 8 inch band and lightly incorporate. Avoid seed contact.
	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 60EC)	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 of formulation/1,000 ft row (minimum 30 inch spacing)	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.
	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.
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.
	fenvalerate <R> (Pydrin 2.4EC)	0.1-0.2 lb	Repeat as necessary to maintain control. Do not exceed 0.8 lb AI per acre per season. Do not feed or graze livestock on treated vines. Wait 21 days before harvest.

Leafhoppers (cont.)	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./1,000 ft row (minimum 30 inch row)	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> aldicarb** (Temik 15G)	1.0-2.0 lb	Drill granules 2-3 inches below seed line OR 2-3 inches to side of seed row and 2-3 inches deep.
	<R> disulfoton* (Di-Syston 15G)	1.0 lb or 6 oz form./ 1,000 ft row	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./1,000 ft row (minimum 30 inch row)	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 per acre 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> 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, Nudrin 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 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> 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.
	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.

*Do not plant any food or feed crop in rotation after a field treatment with disulfoton unless it is a registered use for disulfoton.

**With excess rainfall or irrigation, low pH (6 or lower), low temperature (less than 50° F), and low organic levels (under 1%), chemical breakdown is reduced and may cause residues to move deeper into the soil and possibly contaminate the groundwater.

SUNFLOWER INSECTS
(NebGuide G80-498)

Sunflowers are attacked by a number of insect pests. The control of these pests sometimes requires an application of insecticides during the bloom stage. Sunflowers are highly attractive to bees and honeybee pollination significantly increases yield and oil content of many varieties. To avoid damage to valuable pollinators, first scout fields to be sure an economic population of pests exists. If treatment is needed, warn owners of bee hives located with 2 miles of the intent to spray and allow time for hives to be covered or moved. Treat fields after 8:00 p.m. since bees usually have left the field by that time.

Sunflowers should be scouted for pests regularly to determine the need for treatment. Economic thresholds may vary depending on whether the sunflowers are being grown for oil or seed (confectionary). Check labels for harvest and other use restrictions (listed at the end of this section).

CUTWORMS

Control cutworms if 20% or more of the plants are damaged and/or cut and cutworms are less than 3/4 inch long.

REGISTERED FOR CONTROL OF CUTWORMS ON SUNFLOWERS
Rates are active ingredient per acre.
See Sunflower Insecticide Restrictions.

carbaryl (Sevin 80S, XLR Plus)	1.5 lb
chlorpyrifos (Lorsban 4E)	1.0-1.5 lb
<R> fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb

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

GRASSHOPPERS
(G86-791)

Control grasshoppers if 8 or more are found per square yard and/or 25% defoliation has occurred.

REGISTERED FOR CONTROL OF GRASSHOPPERS ON SUNFLOWERS
Rates are active ingredient per acre.
See Sunflower Insecticide Restrictions.

carbaryl (Sevin 80S, XLR Plus)	1.0-1.5 lb
<R> carbofuran (Furadan 4F)	0.125-0.5 lb
chlorpyrifos (Lorsban 4E)	0.5 lb
<R> fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb

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

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

SEED WEEVILS

Two species of seed weevils occur in Nebraska. One is reddish-brown and slightly over 1/8 inch in length. The other is gray and about 1/4 inch in length. Both have prominent snouts. Adults 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. Treat if 10-12 adults are found per plant (oil) or 1-3 adults are found per plant (confectionary) at 85-100% bloom.

REGISTERED FOR CONTROL OF SEED WEEVILS ON SUNFLOWERS
Rates are active ingredient per acre.
See Sunflower Insecticide Restrictions.

<R> carbofuran (Furadan 4F)	0.5 lb
chlorpyrifos (Lorsban 4E)	0.5-0.75 lb
<R> fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb
<R> methidathion (Supracide 2E)	0.5 lb
<R> methyl parathion	1.0 lb

STEM WEEVIL

The stem weevil is about 3/16 inch long, 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
Rates are active ingredient per acre.
See Sunflower Insecticide Restrictions.

carbaryl (Sevin 80S, XLR Plus)	1.0-2.0 lb
<R> carbofuran (Furadan 4F)	0.5 lb
(Furadan 15G)	8-16 oz. form./1,000 linear feet of row. 7 inch band or in furrow. Apply at planting.
chlorpyrifos (Lorsban 4E)	0.5-0.75 lb
<R> methidathion (Supracide 2E)	0.5 lb
<R> fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb

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 with larvae appearing shortly after the adults. Control if 1-2 adults or 10-15 larvae are found per seedling.

REGISTERED FOR CONTROL OF SUNFLOWER BEETLE ON SUNFLOWERS
Rates are active ingredient per acre.
See Sunflower Insecticide Restrictions.

carbaryl (Sevin 80S, XLR Plus)	1.0-2.0 lb
<R> carbofuran (Furadan 4F)	0.125-0.25 lb
chlorpyrifos (Lorsban 4E)	0.5-0.75 lb
<R> fenvalerate (Pydrin 2.4EC)	0.05-0.1 lb

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

SUNFLOWER MOTH

The sunflower (or sunflower head) moth Homoeosoma electellum (Hulst) is probably the most serious sunflower insect pest. 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. Controls must be applied at early bloom (first ray flowers visible) for acceptable results. Controls are directed at the adult moths, to prevent egg laying. Scout and treat for the sunflower moth in the evening when moths are most active. Control if 1-2 adults are found per 5 plants.

REGISTERED FOR CONTROL OF SUNFLOWER MOTH ON SUNFLOWERS
Rates are active ingredient per acre.
See Sunflower Insecticide Restrictions.

<R> carbofuran (Furadan 4F)	0.5 lb
chlorpyrifos (Lorsban 4E)	0.5-0.75 lb
endosulfan (Thiodan 50WP)	1.0 lb
<R> ethyl parathion 8E, 8F	0.5-1.0 lb
<R> fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb
<R> methidathion (Supracide 2E)	0.5 lb
<R> methyl parathion	1.0 lb

INSECTICIDE RESTRICTIONS ON SUNFLOWERS

Insecticide	Restrictions and Comments
carbaryl (Sevin 80S, XLR Plus)	Do not apply within 60 days of harvest. Do not allow animals to graze in treated areas.
<R> carbofuran (Furadan 4F)	Do not apply within 18 days of harvest. Do not apply more than 4 times per season.
chlorpyrifos (Lorsban 4E)	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)	No harvest restriction. Do not exceed 3 applications. Do not feed treated forage to livestock.
<R> ethyl parathion	Do not apply within 30 days of harvest. No more than 3 applications per season at least 5 days apart.
<R> fenvalerate (Pydrin 2.4EC)	Do not apply within 28 days of harvest. Do not exceed 0.8 lb AI per acre per season.
<R> methidathion (Supracide 2E)	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	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.

ALFALFA SEED INSECTS

Concerns of the seed producer differ from those of the farmer growing alfalfa for forage or hay. Several insects attack the flowers or seeds of alfalfa but do little harm to the vegetative parts. Insect counts are usually taken by the use of a sweep net. The sampling unit used in alfalfa seed fields is a series of five straight (90°) sweeps with a 15 inch diameter sweeping net. The net should be held and swung while walking so the lower half of the opening is drawn through the foliage. Some insects are sampled by cutting stems with a knife, gently lifting them out of the foliage, and observing and counting the insects. Sample at least five different areas in each field, no closer than 30 feet from the field edge.

Protect Pollinators

Legumes in bloom are highly attractive to bees. To prevent bee losses from insecticide poisoning and to reduce the hazard, observe the following:

1. Select an insecticide of low toxicity to bees.
2. Never spray a crop in bloom unless it is absolutely necessary.
3. Spray during late evening hours (after 8 p.m.) after the bees have left the fields.
4. Notify local beekeepers having bee yards located within two miles of fields to be sprayed.
5. Do not dump unused sprays - they may become bee poisoning hazards. Honeybees frequently collect water from puddles to cool the hive.
6. Sevin and Penncap-M are extremely hazardous to bees and are not recommended for use on alfalfa seed fields.

ALFALFA SEED CHALCID

The alfalfa seed chalcid is a small, jet black, shiny wasp about 1/12 inch long. Eggs are laid in the spring and larvae develop within the seed. No chemical control program is available for the alfalfa seed chalcid. Destroy or burn chaff stacks and screenings early in the spring. Remove volunteer and waste area alfalfa plants, since these act as a reservoir for the pest. Cultivation and irrigation in the fall will reduce overwintering chalcid populations.

ALFALFA WEEVIL
(NebGuide G73-30)

Watch for the first sign of larval feeding in April and May. Larvae feed in the tips of alfalfa stems, and early damage appears as tiny shotholes. Look for small, greenish-yellow larvae, about 1/8 inch long, with dark brown heads and a white stripe down the middle of the back. The worms will grow to about 3/8 inch long. Treat if 35% or more of the tips are damaged.

REGISTERED FOR CONTROL OF ALFALFA WEEVIL LARVAE ON ALFALFA

Insecticide	Rate AI/Acre	Restrictions and Comments
carbofuran <R> (Furadan 4F)	0.25-1.0 lb	Apply only to pure stands of alfalfa. Only 1 application/cutting. Do not move bees into treated areas within 7 days of treatment. See label for harvest restrictions.
chlorpyrifos (Lorsban 4E)	0.5-1.0 lb	Do not apply more than once/cutting. See label for harvest restrictions.
diazinon AG500	1.0 lb	Wait 10 days. Do not apply during bloom.
dimethoate (Cygon 400)	0.25-0.50 lb	Do not apply during bloom. Do not feed or graze livestock in treated crops, hay, threshings, or stubble within 10 days of application.
<R> ethyl parathion 8EC	0.5 lb	Wait 15 days.
malathion 57EC	1.0-1.25 lb	No time limitations. During bloom, apply only in the evening or early morning.
methidathion <R> (Supracide)	0.5-1.0 lb	Wait 10 days. One application per cutting.
methomyl <R> (Lannate L, Nudrin L)	0.9 lb	Wait 7 days. Do not apply to dormant or semi-dormant alfalfa when temp. is 50° F or lower. Do not apply when alfalfa is in bloom.
methoxychlor 25EC	1.5 lb	Wait 7 days before harvest.
<R> methyl parathion 8EC	0.5 lb	Wait 15 days before harvest. Do not apply during bloom.
phosmet (Imidan 50WP)	1.0 lb	Only 1 application per cutting. Do not graze or cut for 7 days.

APHIDS

Spotted alfalfa aphids are small (1/16 inch long) pale yellow or grayish aphids with 4 to 6 rows of dark spots on the back. They inject a toxin that kills leaves, causing them to drop. These aphids also produce large amounts of honeydew which supports the growth of a black sooty mold, which covers leaves and lower portions of the stem. An average of one aphid per plant in seedling stands can kill the entire field. In older stands, treat when 20-30 aphids are found per stem. Since spotted alfalfa aphids are found on the lower portions of the plant, cut stems with a sharp knife and gently lift plants to count the aphids on the stem and undersides of leaves.

Pea aphids and blue alfalfa aphids are about 1/8 inch long and difficult to separate in the field. They range in color from yellow to bluish-green. The blue alfalfa aphid has uniformly brown antennae, and the pea aphid has a narrow dark band at the top of the third antennal segment. The blue alfalfa aphid is a more serious pest than the pea aphid. It injects a toxin causing stunting, shortened internodes, yellowing, and crinkling of leaves. Heavy infestations of pea aphids cause plants to wilt. Normally, pea aphid populations must be 300 or more per sweep to justify controls. Blue alfalfa aphids can cause damage at lower levels. Apply pre-bloom materials at least 7 days before bloom to protect pollinators.

REGISTERED FOR CONTROL OF APHIDS ON ALFALFA

Insecticide	Rate AI/Acre	Restrictions and Comments
chlorpyrifos (Lorsban 4E)	0.5-1.0 lb	Pre-bloom only. Do not cut or graze within 14 days of application. Do not make more than 4 applications per year.
diazinon AG500, 50W	0.5 lb	Pre-bloom only. Use at temperatures of 60° F or higher. 7 day harvest restriction.
dimethoate (Cygon 400)	0.25-0.5 lb	Pre-bloom only. Do not feed, graze, or harvest within 10 days of application.
disulfoton* <R> (Di-Syston 8EC)	1.0 lb	Pre-bloom. Do not apply within 14 days of harvest.
malathion 57EC	1.0-1.25 lb	No time limitations. During bloom, apply only in the evening or early morning. Use at temperatures of 60° F or higher.

methidathion <R> (Supracide 2E)	0.5 lb	Pre-bloom. Do not harvest or feed treated foliage within 10 days of application.
oxydemeton methyl (Metasystox-R)	0.25 lb	Pre-bloom or bloom. Do not cut green crop for hay or forage or harvest within 21 days of treatment.

*Do not plant any food or feed crop in rotation after a field treatment with disulfoton unless it is a registered use for disulfoton.

GRASSHOPPERS
(G86-791)

<R> Carbofuran (Furadan 4F), chlorpyrifos (Lorsban 4E), or Dimethoate (Cygon) sprays at pre-bloom will provide good control of grasshopper nymphs. See discussion on forage alfalfa in EC 87-1511 for description of grasshoppers and damage. Treat if 8 or more hoppers are found per square yard.

LYGUS BUGS

Lygus bugs are major pests of alfalfa seed in most areas of the country. Both adults and nymphs feed on buds, flowers, and seeds with their sucking mouthparts. Adults are green or brown bugs, about 3/16 inch long and about half as wide. There is a distinct triangle about 1/3 of the distance down the back. The young "nymphs" are tiny, aphid-like in appearance, and bluish-green in color. Nymphs can be distinguished from adults by the presence of wing pads instead of wings.

Lygus bugs do their greatest damage by feeding on alfalfa buds. Nymphal feeding is more destructive than that of adults. Alfalfa buds bleach, die, and drop 2 to 5 days after feeding. The bugs also feed on the immature seeds within the pods, causing them to shrivel and turn brown. Lygus bug feeding during blossoming causes flowers to drop, although not all flower drop can be attributed to lygus bugs.

Economic levels of lygus bugs for various growth stages are as follows (nymphs count as adults because of greater damage potential): pre-bloom - 2 per sweep, full bloom - 5 per sweep, post-bloom - 8 per sweep. Pre-bloom sprays should be applied 7 to 14 days before pollinators appear.

REGISTERED FOR CONTROL OF LYGUS BUGS ON ALFALFA

Insecticide	Rate AI/Acre	Restrictions and Comments
carbofuran <R> (Furadan 4F)	1.0 lb	Pre-bloom only. One application per season. Do not harvest or graze within 28 days of application. Use at least 14 days before bloom.
dimethoate (Cygon 400)	0.25-0.5 lb	Pre-bloom only. Do not feed, graze, or harvest within 10 days of application. Use at least 7 days before bloom.
endosulfan (Thiodan 3EC)	1.5 lb	Pre-bloom only. Allow 21 days before harvest. Do not feed treated forage to meat or dairy animals. Use at least 7 days before bloom.
malathion 57EC	1.0-1.25 lb	No time limitations. During bloom, apply only in the evening or early morning.
methidathion <R> (Supracide 2EC)	0.5-1.0 lb	Pre-bloom only. Do not harvest or feed treated foliage within 10 days of application. Use at least 7 days before bloom.
trichlorfon (Dylox 80SP)	1.0-1.5 lb	Pre-bloom or bloom. Wait 7 days to harvest. Alkaline spray waters can reduce effectiveness. Increase acidity to pH 5.5 or 6.

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 given in the alfalfa section (page 11) 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 time limitations.
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 a slight amount of feeding injury on potatoes and other vegetables, due to standards set by Federal and State authorities, can render them unmarketable. Therefore, insect losses on truck crops are high in proportion to the amount of plant consumed.

SOIL INSECTS

CUTWORMS

Cutworms affecting the potato crop 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	Apply to soil surface when pests first appear. Troublesome where soil cracking occurs. Use sufficient water to obtain uniform soil coverage.
diazinon AG500, 50W, 14G	2.0-4.0 lb	35 day harvest restriction.
fenvalerate <R> (Pydrin 2.4EC)	0.1 - 0.2 lb	See label. Do not graze livestock.
methamidophos <R> (Monitor 4)	0.75-1.0 lb	Do not apply later than 14 days before harvest.
permethrin <R> (Pounce 3.2EC, 25WP, Ambush 2E, 25WP)	0.1-0.2 lb	7 day harvest restriction. See label.

FLEA BEETLES

Two species of flea beetle larvae attack the potato tuber, either etching the surface or making small tunnels (referred to as "slivers") in the tuber.

REGISTERED FOR CONTROL OF FLEA BEETLE LARVAE ON POTATOES

Insecticide	Rate Form./Acre	Restrictions and Comments
aldicarb* <R> (Temik 15G)	14.5-23 oz form./ 1,000 ft row	Apply at planting according to label directions. Do not harvest within 90 days. Furrow or band 2 lb in lighter soil, 3 lb in heavy soil.
carbaryl (Sevin XLR Plus)	0.5-1.0 lb AI/A	No waiting period.
carbofuran <R> (Furadan 15G)	24 oz form. per 1,000 ft row	Apply into bottom of furrow during planting.
disulfoton** <R> (Di-Syston 15G)	15.0 to 23.0 oz form./1,000 ft row	Band application at planting. Do not apply within 75 days of harvest. 2 lb sandy soil, 3 lb heavy soil.

fenvalerate <R> (Pydrin 2.4EC)	5.3-10.6 oz	Do not apply within 7 days of harvest. Do not feed or graze treated foliage.
permethrin <R> (Pounce 3.2EC)	4-8 oz	Do not apply within 7 days of harvest. Do not feed or graze treated foliage.
<R> (Pounce 25WP)	6.4-12.8 oz	See restrictions above.
phorate <R> (Thimet 20G)	11.3-17.3 oz form./1,000 ft row	Band application at planting time or in furrow. Wait 90 days before row harvest. 2 lb sandy soils, 3 lb heavy soils.

*With excess rainfall or irrigation, low pH (6 or lower), low temperature (less than 50° F), and low organic levels (under 1%), chemical breakdown is reduced and may cause residues to move deeper into the soil and possibly contaminate the groundwater.

**Do not plant any food or feed crop in rotation after a field treatment with disulfoton unless it is a registered use for disulfoton.

WIREWORMS

Wireworms are difficult to control. Wireworm damage is most likely when planting potatoes after sod. The hard-bodied, slender brown larvae bore into the underground stem causing the young plants to wither and die. Tubers have long slender tunnels eaten into them.

REGISTERED FOR CONTROL OF WIREWORMS ON POTATOES

Insecticide	Rate AI/Acre	Restrictions and Comments
diazinon AG500	0.75-1.5 lb	Preplant broadcast application; incorporate immediately into top 4-8 inches by disk or harrow.
ethoprop <R> (Mocap 10G) <R> (Mocap 6EC)	3.0 lb 3.0 lb	Band application at planting. See label if broadcast.
fensulfothion <R> (Dasanit 15G)	5.0 lb	Preplant broadcast, incorporate 3-4 inches.
fonofos <R> (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.
phorate <R> (Thimet 20G)	11.3-17.3 oz	Band application or in furrow at planting. 2 lb sandy soil, 3 lb heavy soil.

FOLIAR INSECTS

RECOMMENDATIONS FOR CONTROL OF FOLIAR INSECTS ON POTATOES

Insect	Insecticide	Rate AI/Acre	Restrictions and Comments
Aphids: Buckthorn Green Peach Potato	diazinon AG500, 50W	0.25-0.375 lb	35 day harvest restriction.
	dimethoate (Cygon 400)	0.5 lb	Apply control when 5 or more aphids are caught in traps.
	fenvalerate <R> (Pydrin 2.4EC)	0.1-0.2 lb	Do not graze livestock on treated vines.
	malathion 57EC	1.25 lb	No restrictions.
	methamidophos <R> (Monitor 4)	1.0 lb	14 day harvest restriction. Do not graze livestock.
	permethrin <R> (Ambush 2E & 25W)	0.05-0.2 lb	7 day harvest restriction.
	phorate <R> (Thimet 20G)	11.3-17.4 oz form./1,000 ft row	Band or in furrow at planting. 2 lb sandy soil; 3 lb heavy soil. Do not apply within 90 days of harvest.

Armyworm		carbaryl (Sevin 80S)	2.0 lb	Apply to nearby vegetation before they move into adjacent fields.
	<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	Do not apply within 7 days of harvest. Do not graze or feed potato foliage.
Colorado Potato Beetle		carbaryl (Sevin 80S, XLR Plus)	1.0 lb	No restrictions.
	<R>	carbofuran (Furadan 4F)	0.5-1.0 lb	Do not apply within 14 days of harvest. Apply by ground equipment only.
		diazinon AG500, 50W	0.25-0.375 lb	35 day harvest restriction.
		endosulfan (Thiodan 50WP)	1.0 lb	Do not plant root crops other than carrots, potatoes, sugarbeets, or sweet potatoes as follow-up crops.
	<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	5 day harvest restriction.
	<R>	permethrin (Ambush 2E, 25WP)	0.05-0.2 lb	7 day harvest restriction.
	<R>	(Pounce 3.2EC, 25WP)	0.1-0.2 lb	7 day harvest restriction. Do not graze livestock.
	<R>	phorate (Thimet 20G)	17.3 oz form/ 1,000 ft row	Band or in furrow at planting. Heavy or clay soils only (early season control). 90 day harvest restriction.
		phosalone (Zolone 3EC)	0.5-1.5 lb	Do not graze livestock. Do not tank mix with disulfoton.
		phosmet (Imidan 50WP)	1.0 lb	7 day harvest restriction.
European Corn Borer	<R>	azinphos-methyl (Guthion 50WP)	0.5 lb	Do not apply within 7 days of harvest.
		carbaryl (Sevin 80S, XLR Plus,	2.0 lb	No restrictions.
	<R>	carbofuran (Furadan 15G)	1.5 lb/1,000 ft row	Apply direct in seed furrow during planting.
	<R>	(Furadan 4F)	0.5-1.0 lb	14 day harvest restriction.
	<R>	fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb	See label. Do not graze.
	<R>	methamidophos (Monitor 4)	0.75-1.0 lb	Do not graze livestock.
	<R>	methyl parathion (Penncap-M)	0.5-1.0 lb	Do not apply within 5 days of harvest.
	<R>	permethrin (Pounce 3.2EC, 25WP)	0.1-0.2 lb	7 day harvest restriction. Do not graze.
		phosalone (Zolone 3EC)	1.0 lb	Do not graze livestock. Do not tank mix with disulfoton.

Flea Beetle Adults	<R>	azinphos-methyl (Guthion 2S)	0.75 lb	Apply with sufficient water for coverage. Do not apply within 7 days of harvest.
		carbaryl (Sevin 80S, XLR Plus)	1.0 lb	No restrictions.
	<R>	carbofuran (Furadan 4F)	0.5-1.0 lb	Do not apply within 14 days of harvest.
		endosulfan (Thiodan 50WP)	1.0 lb	Do not plant root crops other than carrots, potatoes, sugarbeets, and sweet potatoes as follow-up crops.
	<R>	fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb	Do not exceed 1.4 lb AI/acre/season. Do not graze livestock on treated vines.
	<R>	methamidophos (Monitor 4)	0.75-1.0 lb	Apply in a 7-10 day preventive program or as necessary. Do not apply within 14 days of harvest.
	<R>	methyl parathion (Penncap-M)	0.5-1.0 lb	Do not apply within 5 days of harvest.
	<R>	permethrin (Pounce 3.2EC)	0.1-0.2 lb	7 day harvest restriction. No more than 12 applications/season. Do not graze or feed.
	<R>	(Ambush 2E, 25W)	0.05-0.2 lb	7 day harvest restriction.
		phosmet (Imidan 50WP)	1.0 lb	Do not apply within 7 days of harvest.
Grasshoppers		carbaryl (Sevin 80S, XLR Plus)	1.5 lb	No restrictions.
		dimethoate (Cygon 400)	0.25-0.5 lb	No restrictions.
	<R>	fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb	Do not feed or graze vines. Wait 7 days to harvest.
		malathion 57EC	1.25 lb	No restrictions.
	<R>	methyl parathion (Penncap-M)	0.5-1.0 lb	5 day harvest restriction.
Leafhoppers		carbaryl (Sevin 80S, XLR Plus)	1.5 lb	No restrictions.
	<R>	carbofuran (Furadan 4F)	0.5-1.0 lb	14 day harvest restriction. No more than 8 applications/season.
		diazinon AG500	0.357-0.5 lb	35 day harvest restriction.
		dimethoate (Cygon 400)	0.5 lb	No restrictions.
	<R>	fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb	Do not graze livestock on treated vines.
		malathion 57EC	1.25 lb	No restrictions.
	<R>	methyl parathion (Penncap-M)	0.5-1.0 lb	Do not apply within 14 days of harvest.
	<R>	permethrin (Pounce 3.2EC, 25WP, Ambush 2E, 25WP)	0.1-0.2 lb	7 day harvest restriction. Do not graze.
	<R>	phorate (Thimet 20G)	11.3-17.3 oz form./1,000 ft row	Band or in furrow at planting. 2 lb sandy soil; 3 lb heavy soil. Do not apply within 90 days of harvest.
		phosmet (Imidan 50WP)	1.0 lb	Do not apply within 7 days of harvest.

Potato Psyllid	carbaryl (Sevin 80WP)	2.0 lb	No restrictions.
	disulfoton* <R> (Di-Syston 8EC, 15G)	2.0-3.0 lb	Do not apply within 75 days of harvest.
	endosulfan (Thiodan 50WP)	1.0 lb	Do not plant root crops other than carrots, potatoes, sugarbeets and sweet potatoes as follow-up crops.
	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	7 day harvest restriction.
	phorate <R> (Thimet 20G)	11.3-17.3 oz form./1,000 ft row	Band or in furrow at planting. 2 lb sandy soil; 3 lb heavy soil. Do not apply within 90 days of harvest.

*Do not plant any food or feed crop in rotation after a field treatment with disulfoton unless it is a registered use for disulfoton.

ONION INSECTS
(NebGuide G76-304)

Onion acreage in Nebraska fluctuates from year to year. There is a trend toward increased acres when year to year comparisons are made. The primary insect pests of onions in Nebraska are the onion maggot and thrips. In addition to the chemical controls listed below, crop rotation will aid in onion maggot management.

REGISTERED FOR CONTROL OF INSECTS ON ONIONS

Insect	Insecticide	Rate AI/Acre or Formulation When Noted	Restrictions and Comments
Onion Maggot	chlorpyrifos (Lorsban 4E)	1.1 oz/1,000 ft row (18")	Drench in furrow. One application per year.
	(Lorsban 15G)	3.7 oz/1,000 ft row (18")	In furrow. One application per year.
	diazinon 14G	14-28 lb formulation	Broadcast prior to planting and incorporate 3-4 inches.
	diazinon 50W	21 lb formulation	Apply in sufficient water formulation to drench seed furrow at planting.
	diazinon AG500	1.0 lb	Apply in sufficient water to drench seed furrow at planting.
	fonofos (Dyfonate 10G)	1.0 lb	To be used on soils with greater than 10% organic matter.
	<R> (Dyfonate 4EC)	1.0 lb	See above.
Onion Maggot Adults	malathion 57EC	1.5 to 2.5 pt. of form. or 1.0-1.6 lb	Wait 3 days to harvest. Begin spraying when flies first appear and repeat every 10 to 14 days.
Thrips	azinphos-methyl <R> (Guthion 2S)	0.5-0.75 lb	Apply specified dosage per acre 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, nor within 28 days of harvest of dry onions, or 7 days of harvest of green onions.
	diazinon AG500, 50W	0.5 lb	Wait 10 days to harvest.
	malathion 57EC	1.0-1.25 lb	Wait 3 days.
	methomyl <R> (Lannate L, Nudrin L)	0.45 lb	Add wetting agent. Wait 7 days dry, 28 days green.
	methyl parathion <R> (Penncap-M)	0.5 lb	Do not apply when onions are blooming to avoid injury to bees. Do not apply within 15 days of harvest.

1987
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