University of Nebraska - Lincoln
DigitalCommons@University of Nebraska - Lincoln

Historical Materials from University of Nebraska-Lincoln Extension

Extension

1988

EC88-1537 Field Crop Insect Management Guide for Nebraska Special Crops - Sugarbeets, Dry Beans, Sunflowers, Alfalfa Seed, Vetch, Potatoes, Onions

F. P. Baxendale
University of Nebraska-Lincoln, fbaxendale1@unl.edu

S. D. Danielson
University of Nebraska-Lincoln, sdanielson1@unl.edu

J. F. Witkowski

Follow this and additional works at: http://digitalcommons.unl.edu/extensionhist

Baxendale, F. P.; Danielson, S. D.; and Witkowski, J. F., "EC88-1537 Field Crop Insect Management Guide for Nebraska Special Crops - Sugarbeets, Dry Beans, Sunflowers, Alfalfa Seed, Vetch, Potatoes, Onions" (1988). *Historical Materials from University of Nebraska-Lincoln Extension*. 4638.
http://digitalcommons.unl.edu/extensionhist/4638

This Article is brought to you for free and open access by the Extension at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Historical Materials from University of Nebraska-Lincoln Extension by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

AGRI
S
85
E7

Nebraska Cooperative Extension Service EC 88-1537

FIELD CROP INSECT MANAGEMENT GUIDE FOR NEBRASKA SPECIALITY CROPS - SUGARBEETS, DRY BEANS, SUNFLOWERS, ALFALFA SEED, VETCH, POTATOES, ONIONS

UNIV. OF NEBRASKA-
LINCOLN LIBRARIES

DEC 22 1987

F.P. Baxendale, S.D. Danielson, J.F. Witkowski
J.B. Campbell, L.L. Peters, A.F. Hagen, D.L. Keith
Extension Entomology Specialists
K.J. Jarvi, IPM Extension Assistant
R.C. Seymour, IPM Extension Assistant
J.A. Kalisch, Extension Technologist (Entomology)

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

INDEX TO THIS PUBLICATION

Subject	Page No.
Abbreviations	6
Alfalfa (Seed) Insects	15
Alfalfa Seed Chalcid	15
Alfalfa Weevil	15
Aphids	
Alfalfa (Seed)	16
Dry Beans	9
Potatoes	20
Sugarbeets	6
Vetch	18
Armyworms	
Potatoes	21
Sugarbeets	7
Vetch	18
Chemigation	3
Colorado Potato Beetle	21
Conservation Tillage/Insect Pests	4
Container Disposal	6
Cutworms	
Potatoes	19
Sugarbeets	7
Sunflowers	12
Dry Bean Insects	9
Endangered Species Act	3
European Corn Borer/Potatoes	22
Flea Beetles	
Potatoes	
Foliar (Adults)	22
Soil (Larvae)	19
Sugarbeets	8
Grasshoppers	
Alfalfa (Seed)	17
Dry Beans	10
Potatoes	23
Grasshoppers (Con't.)	
Sugarbeets	8
Sunflowers	12
Insecticides	
Field Re-Entry Times	5
Performance	3
Restricted Use	2
Sprayed by Mistake?	4
Toxicity	2
Who to Call	2
Leafhoppers	
Dry Beans	10
Potatoes	23
Sugarbeets	8
Lygus Bugs/Alfalfa (Seed)	17
Mexican Bean Beetle	11
Management Decision Guidelines/ Economic Thresholds	3
Onion Insects	24
Potato Insects	18
Potato Psyllid	24
Protect Bees	4
Protect Pollinators	15
Seed Weevils/Sunflowers	13
Sugarbeet Insects	6
Sunflower Insects	12
Sunflower Moths	14
Vetch Insects	18
Webworms/Sugarbeets	8
Western Bean Cutworm/Dry Beans	12
Wireworms	
Potatoes	20
Sugarbeets	8

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.

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 a **<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 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 given 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 that is available from your local pesticide dealer, Cooperative Extension Service office, or the Environmental Protection Agency.

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 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 vegetable or fruit. The following are some 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 20G	NR	NR	30	NR	*	NR	NR	NR
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	NR	**	7-21	**	7	NR	21	NR
Nudrin 1.8L	1	3	0	1-3	1	7-10	1-3	8
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	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 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.

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 spray is dry
or dust settles
Di-Syston 8EC, 15G - 24 hrs
Dyfonate 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
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
Nudrin 1.8L, 90S
- When spray is dry
Parathion (ethyl and methyl) - 48 hrs
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
- 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.

RECOMMENDATIONS FOR CONTROL OF SUGARBEET INSECTS

Insect	Insecticide	Rate AI/Acre or Formulation When Noted	Restrictions and Comments
Aphids	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.
	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)	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	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.
Beet Root Maggot	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 form. (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 form.	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.
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	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.
Symphylans and Wireworms	diazinon 14G	21-28 lb form.	Wireworms only. Apply prior to planting; incorporate at 4-8 inches.
	diazinon AG500	3-4 lb	Wireworms only. Apply prior to planting; incorporate at 4-8 inches.
	fonofos <R> (Dyfonate 4EC)	4 lb form.	Broadcast prior to planting and incorporate.
	(Dyfonate 10G)	40 lb form.	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 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.

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.
	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.
	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 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.
	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.
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.
	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.
	malathion 57EC	1.25 lb	Wait 1 day before harvest.
	malathion ULV 9.33	0.6 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 area. Do not apply within 15 days of harvest.
	phorate <R> (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.		
	disulfoton <R> (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.
	phorate <R> (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.		
	azinphos-methyl <R> (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.
	esfenvalerate <R> (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.
	fenvalerate <R> (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.
	methomyl <R> (Lannate L, Nudrin L)	0.5 lb	Wait 25 days 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, 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> 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.
	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.

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.
carbofuran <R> (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.
fenvalerate <R> (Pydrin 2.4EC)	Do not apply within 28 days of harvest. Do not exceed 0.8 lb AI per acre per season.
methidathion <R> (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.
methyl paration <R> (Penncap-M)	0.5-0.75 lb	Do not apply with 7 days prior to or during bloom. Wait 15 days before harvest or grazing.
phosmet (Imidan 50WP)	1.0 lb	Only 1 application per cutting. Do not graze or cut for 7 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
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 application. See label for harvest restrictions.
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.
methyl parathion <R> (Penncap-M)	0.5-0.75 lb	Do not apply within 7 days prior to or during bloom. Wait 15 days before harvest or grazing. Not registered for control of spotted alfalfa aphid.
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.

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 88-1511 for description of grasshoppers and damage. Consider treatment 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 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 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 slight amounts of feeding injury on potatoes and other vegetables can render them unmarketable, due to standards set by Federal and State authorities. This increases the importance of routine scouting that will assist in determining when threatening insect pest infestations are present.

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.
esfenvalerate <R> (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/A per season. Wait 7 days to harvest.
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)	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 AI/Acre	Restrictions and Comments
carbaryl (Sevin XLR Plus)	0.5-1.0 lb	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.
esfenvalerate <R> (Asana 1.9EC)	0.025-0.05 lb	Repeat as necessary to maintain control. Do not graze livestock graze livestock on treated vines. Do not exceed 0.35 lb AI/A per season. Wait 7 days to harvest.
fenvalerate <R> (Pydrin 2.4EC)	0.1-0.2 lb	Do not apply within 7 days of harvest. Do not feed or graze treated foliage.
permethrin <R> (Pounce 3.2EC, 25WP, Ambush 2E, 25WP)	0.1-0.2 lb	Do not apply within 7 days of harvest. Do not feed or graze treated foliage.

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 harvest. 2 lb sandy soils, 3 lb heavy soils.

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)	2.5 oz form./ 1,000 ft row	Band application at planting. See label if broadcast.
<R> (Mocap 6EC)	3.0 lb	See above.
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 form./1,000 ft row	Band application or in furrow at planting. Lower rate is for sandy soils. Do not apply within 90 days of harvest.

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.
	esfenvalerate <R> (Asana 1.9EC)	0.025-0.05 lb	Repeat as necessary to maintain control. Do not Do not graze livestock on treated vines. Do not exceed 0.35 lb AI/A per season. Wait 7 days to harvest.
	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)	11.3-17.3 oz form./1,000 ft row	Band or in furrow at planting. Lower rate is for sandy soils. Do not apply within 90 days of harvest.
Armyworm	carbaryl (Sevin 80S, XLR Plus)	2.0 lb	Apply to nearby vegetation before they move into adjacent fields.
	esfenvalerate <R> (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/A per season. Wait 7 days to harvest.
	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 graze livestock.
	permethrin <R> (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.
	carbofuran <R> (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.
	esfenvalerate <R> (Asana 1.9EC)	0.0125-0.025 lb	Repeat as necessary to maintain control. Do not graze livestock on treated vines. Do not exceed 0.35 lb AI/A per season. Wait 7 days to harvest.
	fenvalerate <R> (Pydrin 2.4EC)	0.05-0.1 lb	Do not graze livestock.
	methamidophos <R> (Monitor 4)	0.75-1.0 lb	Do not graze livestock.
	methyl parathion <R> (Penncap-M)	0.5-1.5 lb	5 day harvest restriction.
	permethrin <R> (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.
	phorate <R> (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>	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/A per season. Wait 7 days to harvest.
	<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>	esfenvalerate (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 prior to harvest.
	<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.

	methyl parathion <R> (Penncap-M)	0.5-1.0 lb	Do not apply within 5 days of harvest.
	permethrin <R> (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.
	esfenvalerate <R> (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/A per season. Wait 7 days to harvest.
	fenvalerate <R> (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.
	methyl parathion <R> (Penncap-M)	0.5-1.0 lb	5 day harvest restriction.
Leafhoppers	carbaryl (Sevin 80S, XLR Plus)	1.5 lb	No restrictions.
	carbofuran <R> (Furadan 4F)	0.5-1.0 lb	14 day harvest restriction. No more than 8 applications/season.
	diazinon AG500	0.375-0.5 lb	35 day harvest restriction.
	dimethoate (Cygon 400)	0.5 lb	No restrictions.
	esfenvalerate <R> (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/A per season. Wait 7 days prior to harvest.
	fenvalerate <R> (Pydrin 2.4EC)	0.1-0.2 lb	Do not graze livestock on treated vines.
	malathion 57EC	1.25 lb	No restrictions.
	methyl parathion <R> (Penncap-M)	0.5-1.0 lb	Do not apply within 14 days of harvest.
	permethrin <R> (Pounce 3.2EC, 25WP, Ambush 2E, 25WP)	0.1-0.2 lb	7 day harvest restriction. Do not graze.

	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.
	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.
	esfenvalerate <R> (Asana 1.9EC)	0.0125-0.025 lb	Repeat as necessary to maintain control. Do not graze livestock on treated vines. Do not exceed 0.35 lb AI/A per season. Wait 7 days to 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	7 day harvest restriction.
	phorate <R> (Thimet 20G)	11.3-17.3 oz form./1,000 ft row	Band or in furrow at planting. Lower rate is for sandy soils. Do not apply within 90 days of harvest.

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 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

Insect	Insecticide	Rate AI/Acre or Formulation When Noted	Restrictions and Comments
Onion Maggot	chlorpyrifos (Lorsban 4E)	1.1 fl. oz/1,000 ft row (18")	Drench in furrow. One application per year. Incorporate to depth of 1-2 inches.
	(Lorsban 15G)	3.7 oz form./1,000 ft. row (18")	In furrow. One application per year.
	diazinon 14G	14-28 lb form.	Broadcast prior to planting and incorporate 3-4 inches.
	diazinon 50W	2 lb	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 with in 15 days of harvest.