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

Historical Materials from University of Nebraska-Lincoln Extension

Extension

1984

EC84-1537 Field Crops Insect Control Guide for Nebraska (Specialty Crop[s - Sugarbeets, Dry Beans, Sunflowers, Alfalfa Seed, Vetch, Potatoes

D. L. Keith

L. L. Peters

J. F. Witkowski

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

Keith, D. L.; Peters, L. L.; and Witkowski, J. F., "EC84-1537 Field Crops Insect Control Guide for Nebraska (Specialty Crop[s - Sugarbeets, Dry Beans, Sunflowers, Alfalfa Seed, Vetch, Potatoes" (1984). *Historical Materials from University of Nebraska-Lincoln Extension*. 4483.
http://digitalcommons.unl.edu/extensionhist/4483

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
#84-1537
C1

FIELD CROPS INSECT CONTROL GUIDE FOR NEBRASKA
(Specialty Crops - Sugarbeets, Dry Beans, Sunflowers, Alfalfa Seed, Vetch, Potatoes)

D. L. Keith, L. L. Peters, J. F. Witkowski
J. B. Campbell, A. F. Hagen
Agricultural Extension Entomologists
L. W. Andersen, IPM Specialist
K. J. Jarvi, IPM Extension Assistant
S. D. Danielson, Extension Technologist (Entomology)

Insect control suggestions in this guide are based on University of Nebraska research results, U.S.D.A. recommendations and label registrations. Insect control is never perfect. The suggestions are designed to benefit Nebraska farmers when they need control programs. NebGuides containing additional information on identification, damage and life cycles are listed under insect headings. They are available from county extension offices.

Often the choice of a pesticide is based mainly on its cost. However, several other factors should be considered in the decision, including efficacy for the particular pest or pest combination, formulation of the pesticide, label restrictions, safety to non-target species (including man) and environmental conditions present at the time of application.

In some instances trade names have been used. No endorsement is implied by the Nebraska Cooperative Extension Service and no discrimination is intended.

IMPORTANT

All insecticides listed in this publication are subject to many label restrictions on use or on use of the crop after application. Restrictions are so lengthy it is not practical to list all of them. Therefore, it is essential that labels be read and understood before purchasing or using any product to be certain that its use does not result in illegal application, danger to the user or environment, or residues that exceed tolerances.

Insecticides that are classified RESTRICTED USE that require EPA certification for use in this circular are: carbofuran (Furadan 4F), disulfoton (Di-Syston), methomyl (Lannate, Nudrin), ethyl parathion, methyl parathion, Penncap M, azinphos methyl (Guthion), aldicarb (Temik), toxaphene, permethrin (Ambush, Pounce), methamidophos (Monitor 4), methidathion (Supracide), fenvalerate (Pydrin). Applications must be made by or under the direct supervision of a certified applicator. Other products may be classified restricted use in 1984.

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

All insecticides are poisonous and must be used with caution. Always store them in their original containers out of the reach of children, uninformed adults and livestock. It is essential that the label of every insecticide be studied and understood before use. Follow directions completely to avoid accidental poisoning and to prevent illegal residues in crops.

Compounds so marked are restricted use. Applicators must be EPA certified. The highly toxic insecticides in this publication are ethyl parathion, azinphos methyl (Guthion), carbofuran (Furadan 4F), methyl parathion, disulfoton (Di-Syston), phorate (Thimet), terbufos (Counter), and aldicarb (Temik). Skull and crossbones and the word Poison appear in red on the label of highly toxic materials. These chemicals are not recommended for farmer application as sprays. They must be applied only by certified operators. However, with proper precautions, farmers should be able to use granular formulations for soil application to control corn rootworms. Furadan 4F is highly toxic orally - farmers can use this product if special precautions are taken.

Moderately toxic insecticides are diazinon, acephate (Orthene), carbofuran (Furadan 15G), chlorpyrifos (Lorsban), carbaryl (Sevin), malathion, permethrin (Pounce, Ambush), dimethoate (Cygon), naled (Dibrom), oxydemetonmethyl (Metasystox-R), toxaphene, carbophenothion (Trithion), fenvalerate (Pydrin), and lindane. They must be used with special care. Familiarize yourself with all warnings given on the labels.

Registrations of some chemicals listed in this publication are subject to review and withdrawal in 1984. Visit with your county agricultural agent if you are uncertain of which insecticides to use.

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, clean crop culture and proper irrigation tend to minimize pest damage. Major insect pests of beets are the sugarbeet webworm, root maggots, armyworms, cutworms, and flea beetles.

INSECT CONTROL RECOMMENDATIONS FOR SUGARBEETS

Insect	Insecticide	Amount AI/Acre	Restrictions
Aphids	malathion 57EC	1.0 lb	Wait 3 days if tops to be used for feed.
	parathion 4EC	0.5 lb	Wait 15 days.
	Temik 15G (at planting)	1.0-2.1 lb	Drill granules 1 to 3 in. below seed line. Granules can be placed in seed furrow if rate does not exceed 7 lbs per acre.

Flea beetle adults	◉ parathion 46 EC	0.5 lb	Wait 15 days.
Leafhoppers	diazinon 50W, AG500	8 oz	
	◉ disulfoton LC	1.0 lb	Wait 30 days.
	Metasystox-R SC	12 oz	Wait 30 days.
	carbaryl (Sevin)	1.5 lb	Wait 14 days.
	Dibrom	1.0 lb	Wait 5 days.
	◉ Temik 15G (at planting)	2.1-3 lb	Drill granules 1-3 in. below seed line. Granules can be placed in seed furrow if rate does not exceed 7 pounds per acre.
Webworms	Dylox 80SP, 4LS	1.5 lb	Wait 14 days. Treat if populations average 2-3 worms/plant first generation, or 5-7/plant second generation.
	carbaryl (Sevin 80 WP)	1.5 lb	Wait 14 days.
	◉ parathion 4 EC	0.5 lb	Wait 15 days.
	◉ methomyl (Lannate, Nudrin)	0.5 lb	Wait 7 days. 30 days before grazing tops.
Soil Insects	diazinon 14G, AG500	3.0 lb	Broadcast on soil and immediately work into the upper 6 inches, 1 week before planting in fields that have had problems.
	phorate (Thimet 10G)	1.0 lb	Apply in a band close to seed row, BUT NOT IN CONTACT WITH SEED at planting time.
Beet Root maggot	phorate (Thimet 15G)	6 oz/1000 ft* row	Same as for aphid control (planting).
	terbufos (Counter 15G)	4.5-9.0 oz/1000* ft of row for any row spacing	Only one application per year may be used. (Minimum 20 in row spacing)
	diazinon 14G (planting)	8 oz/1000 ft row*	Apply ahead of press wheel in a 5-7 inch band. Do not apply in direct contact with seed.
	(postemergence)	6 oz/1000 ft row*	Apply in 5-7 inch band over row.
	Dasanit 15G	8 oz/1000 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.

	Lorsban 15G	4.5-9 oz/1000 ft of row at planting or postemergence*	Apply at planting treatment in front of press wheel. Incorporate postemergence treatment ½ in. to 1 in. Do not make more than one application per year.
	✋ 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 for seed germination, drill granules 2 inches deep and 2 inches from seed row on water furrow side.
Grasshoppers	malathion 57%EC	1.5 lb	Wait 3 days.
	malathion ULV 95%	8 oz	Wait 7 days.
	diazinon (AG500)	8 oz	
	carbaryl (Sevin)	1.5 lb	Wait 14 days.
	✋ parathion	8 oz	Wait 15 days.
Armyworms	carbaryl (Sevin)	1.5 lb	Wait 14 days.
	carbaryl (Sevin 5% bait)	2.0 lb	Wait 14 days.
	✋ parathion	8 oz	Wait 15 days.
Beet Armyworm	trichlorfon (Dylox)	1.0 lb	Wait 14 days.
	✋ methomyl (Lannate)	0.5 lb	Wait 7 days. 30 days before grazing tops.
	chlorpyrifos (Lorsban 4E)	.5-1 lb	Wait 30 days. 8 pints total per season.
Cutworms	Lorsban 15G	4.5-9 oz/1000 ft of row at planting or postemergence	Apply as planting treatment in front of press wheel. Incorporate postemergence treatment ½ in. to 1 in. Do not make more than one application per year.

* Recommendations listed in oz/1000 ft row are ounces of the formulation.

DRY BEAN INSECTS

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.

CONTROL RECOMMENDATIONS FOR DRY BEAN INSECTS

Insect	Insecticide	Amount AI/Acre	Restrictions
Aphids	dimethoate (Cygon 400)	.25-.5 lb	Beans may be harvested on day of application. Do not feed treated vines.
	malathion 57 EC	1.0 lb	Wait 1 day.
	diazinon (AG500)	0.5 lb	Wait 7 days.
	naled (Dibrom 60EC)	1.0 lb	Wait 4 days.
	● parathion 4 EC	0.5 lb	Wait 15 days.
	● 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.
Grasshoppers	dimethoate (Cygon 400)	.25-.5 lb	Beans may be harvested on day of application. Do not feed treated vines.
Leafhoppers	dimethoate (Cygon 400)	.25-.5 lb	Beans may be harvested on day of application. Do not feed treated vines.
	carbaryl (Sevin 80S)	2.0 lb	No restrictions.
	malathion 57%EC	1.0 lb	Wait 1 day.
Mexican bean beetle	PREPLANT - Treat if beetles were a problem the previous season.		
	disulfoton (Di-Syston 15G)	1.0 lb 6 oz/1000 ft row*	Wait 60 days. Band (light incorporation) or sidedress. Avoid seed contact.
	● disulfoton (Di-Syston LC)	1.0 lb	Wait 60 days. 6 inches to 8 inches band and lightly incorporate. Avoid seed contact.
	phorate (Thimet 10%G)	1.0 lb	Wait 60 days. Minimum 30 inch row spacing.

	✋ aldicarb (Temik 15G) (at planting)	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. OR Granules can be placed in seed furrow if rate does not exceed 5 lbs per acre.
	FOLIAR - Treat if egg masses on underside of leaves average 1 or more per 6 plants.		
	carbaryl (Sevin 80 S)	0.5 lb	No restrictions.
	Dylox 4LS	1.0 lb	Wait 14 days.
	✋ methomyl (Lannate, Nudrin)	0.5 lb	Wait 25 days.
	malathion 57 EC	0.5 lb	Wait 1 day.
	malathion ULV	0.5 lb	Wait 1 day.
	✋ azinphos methyl (Guthion 2S)	0.5 lb	Wait 30 days.
	✋ 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 feed or graze livestock on treated vines.
Western bean cutworm	carbaryl (Sevin 80S)	1.0 lb	No restrictions.
	✋ 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.

* Recommendations listed in oz/1000 ft row are ounces of the formulation.

SUNFLOWERS
(NebGuide G80-498)

Historically, sunflowers have been difficult to grow successfully in Nebraska. The crop is attacked by a number of insect pests perhaps the most serious of which is the sunflower head moth. Spray timing is critical and insecticides must be selected and applied with care if damage to pollinators is to be avoided. Honeybees have been shown to increase seed set and oil content of many lines of sunflowers. Avoid spraying of sunflowers that are blooming. If significant bloom is present in the field, and spraying must be done, be certain to warn beekeepers within 2 miles of your intent and allow time to move or cover hives.

SUNFLOWER HEAD MOTH

Eggs are deposited among the florets on the face of the seed head. Larvae hatch within 40-72 hours and feed on florets and developing seeds. Control is directed primarily at the adults, killing them before eggs can be laid. The buff to gray colored adult moths are approximately 3/8 inch long with a wing span of about 3/4 inch. When at rest, the wings are held tightly against the body. Treat in the evening when moths are most active. Timing of insecticide application is critical. Apply treatment, if necessary, at the onset of bloom. Control if 1-2 adults are found per 5 plants.

REGISTERED FOR CONTROL OF SUNFLOWER HEAD MOTH
Amounts are active ingredient per acre.

chlorpyrifos (Lorsban 4E)..... 0.5 lb
endosulfan (Thiodan)..... 1.0 lb
methyl parathion 7.5..... 1.0 lb
parathion 8E, 8F..... 0.5-1.0 lb

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 grayish and about 1/4 inch in length. Both have prominent snouts and are active in mid-to-late summer. The adults lay eggs in the newly developing seeds, and the c-shaped, legless larvae feed on 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).

REGISTERED FOR CONTROL OF SEED WEEVILS
Amounts are active ingredient per acre.

methidathion (Supracide 2E)..... 0.5 lb
methyl parathion 7.5..... 1.0 lb
chlorpyrifos (Lorsban 4E)..... 0.5-0.75 lb

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 sunflower head. Eggs are laid in the head, which later falls. Control guidelines have not been established for this insect and no insecticides are specifically registered for its control.

STEM WEEVIL

The stem weevil is about 3/16 inch long, grayish-brown with white dots on its wing covers. The adults, also active in mid-to-late summer spend their lives on the foliage and upper stems of the plant, and are often found in the leaf axils. Eggs are laid in and larvae feed in the lower stalk. Lodging may result. Control is directed at the adult stage. Treat if 2 adults are found per plant at the 14-leaf to early bud stage.

REGISTERED TO CONTROL STEM WEEVIL
Amounts are active ingredient per acre.

carbaryl (Sevin 80S, XLR)..... 1.0-2.0 lbs
chlorpyrifos (Lorsban 4E)..... 0.5 lb
methidathion (Supracide 2E)..... 0.5 lb

SUNFLOWER INSECTICIDE RESTRICTIONS

Insecticide	Restrictions and Comments
carbaryl (Sevin 80S, XLR)	Do not apply within 60 days of harvest. Do not allow animals to graze in treated areas.
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 pts formulation) per acre per season.
endosulfan (Thiodan)	No harvest restriction. Do not exceed 3 applications. Do not feed treated forage to livestock.
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.
methyl parathion 7.5	Do not apply within 30 days of harvest. No more than 3 applications per season at least 5 days apart.
parathion 8E, 8F	Do not apply within 30 days of harvest. No more than 3 applications per season at least 5 days apart.

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. Because of the importance of pollinators to the production of seed, great care must be taken in the use and selection of pesticides. Because of their extreme toxicity to pollinators, carbaryl (Sevin, Savit) and Penncap M are not recommended for use on alfalfa grown for seed. 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. Sample at least five different areas in each field, no closer than 30 feet from the field edge.

Some insects are sampled by cutting stems with a sharp knife, gently lifting them out of the foliage, and observing and counting the insects.

Protect Pollinators

Insecticides kill honeybees in substantial numbers if they are used carelessly on legumes.

Honeybees do not observe man's artificial boundaries and will enter any field that contains attractive bloom to obtain pollen and nectar. Bees are important to all farmers because their presence means successful pollination of garden vegetables (cucumbers, melons, cantaloupes, squash) and fruits (apples, cherries, peaches, pears, apricots). Spraying a crop like alfalfa, when it is in bloom, can cause disastrous losses for beekeepers and reduced seed yields. The following are suggestions to follow to reduce bee losses:

1. Apply chemicals when bees are not actively foraging. Apply before bloom. Select a material of low toxicity and apply in late evening after bees have returned to hives (Penncap M and Sevin are especially hazardous to honeybees).

2. If pesticides must be applied to blooming alfalfa, notify local beekeepers so bees can be moved or confined during application. NOTE - it is extremely difficult for the beekeeper to move more than just a few hives, and many bees frequently die in the process when they are covered. These are last resorts - it is best to avoid spraying during bloom whenever possible.

3. Never dump unused sprays - they might become bee poisoning hazards. (Bees collect water to cool the hive.)

ALFALFA WEEVIL
(NebGuide G73-30)

The alfalfa weevil increased in 1983 and is expected to cause more damage in 1984. Watch in April and May for the first signs of larval feeding in the tips of alfalfa stems. Earliest damage appears as tiny shotholes - look for

small, greenish or yellowish larvae, about 1/8 inch long, with dark brown heads and a white stripe down the middle of the back, on alfalfa terminals. When full grown, the worms are about 3/8 inch long. Plan to treat for alfalfa weevil if 35 percent of the tips are chewed early in May. As the season progresses, the alfalfa grows, and weevil activity increases, the treatment threshold may need to be raised accordingly.

REGISTERED FOR ALFALFA WEEVIL CONTROL

Insecticide	Rate AI/Acre	Restrictions
azinphos methyl (Guthion 2LC)	0.25-0.75 lb	Apply only once per cutting. See label for harvest restrictions.
carbofuran (Furadan 4F)	0.25, 0.5 or 1.0	Apply only to pure stands of alfalfa. Only 1 application per season. 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 per cutting. See label for harvest restrictions.
diazinon (AG500)	1.0 lb	Wait 10 days.
diazinon 10% plus methoxychlor 20% (Alfatox)	----	Do not apply during bloom. Wait 7 days
malathion 20% plus methoxychlor 20% (Alfacide)	----	Do not apply during bloom. Repeat if necessary. Wait 7 days before harvest.
malathion 57EC	1.25 lb	No time limitations.
methomyl (Lannate, Nudrin)	0.9 lb	Wait 7 days. Do not apply to dormant or semi-dormant alfalfa when temperature is 50°F or lower. Do not apply when alfalfa is in bloom.
methoxychlor 25EC	1.5 lb	Wait 7 days.
phosmet (Imidan 50WP)	1.0 lb	Only 1 application per cutting. Do not graze or cut for 7 days.

parathion (ethyl) (8 lb/gal EC)	0.5 lb	Wait 15 days.
parathion (methyl) (8 lb/gal EC)	0.5 lb	Wait 15 days.
methidathion (Supracide)	0.5-1.0 lb	Do not apply during bloom. Wait 10 days. One application per cutting.

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. Adults are green or brown sucking 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 (called "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. Bugs also feed on immature seeds, puncturing the pods and feeding on the seeds, causing them to turn brown and shrivel. Lygus bug feeding during blossoming causes flowers to drop, although not all flower drop is 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): prebloom - 2 per sweep, full bloom - 5 per sweep, postbloom - 8 per sweep. Prebloom sprays should be applied 7 to 14 days before pollinators appear.

REGISTERED FOR CONTROL OF LYGUS BUGS

Insecticide	Rate AI/Acre	Restrictions
dimethoate (Cygon 400)	0.5 lb	Prebloom only. Do not feed, graze, or harvest within 10 days of application. Use at least 7 days before bloom.
carbofuran (Furadan 4F)	1.0 lb	Prebloom only. One application per season. Do not harvest or graze within 28 days of application. Use at least 14 days before bloom.

endosulfan (Thiodan 3EC)	1.5 lb	Prebloom only. 21 days to harvest. Do not feed treated forage to meat or dairy animals. Use at least 7 days before bloom.
methidathion (Supracide 2EC)	0.5-1.0 lb	Prebloom 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	Prebloom or bloom. Wait 7 days to harvest. Alkaline spray waters can reduce effectiveness. Increase acidity to pH 5.5 or 6.

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. Spotted alfalfa aphids 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 from yellowish 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, and a 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 prebloom materials at least 7 days before bloom to protect pollinators.

REGISTERED FOR CONTROL OF APHIDS

Insecticide	Rate AI/Acre	Restrictions
disulfoton (Di-Syston LC)	1.0 lb	Prebloom. Do not apply within 14 days of harvest.
dimethoate (Cygon 400, Defend)	0.5 lb	Prebloom only. Do not feed, graze, or harvest within 14 days of application.
chlorpyrifos (Lorsban 4E)	0.5 lb	Prebloom only. Do not cut or graze within 14 days of application. Do not make more than 4 applications per year.

diazinon	0.5 lb	Prebloom. Use at temperatures of 60°F or higher. 7 days harvest.
malathion 57EC	1.25 lb	Prebloom. Use at temperatures of 60°F or higher. 7 days harvest.
methidathion (Supracide 2E)	0.5 lb	Prebloom. Do not harvest or feed treated foliage within 10 days of application.
oxydemetonmethyl (Metasystox-R)	0.25 lb	Prebloom or bloom. Do not cut green crop for hay or forage or harvest within 21 days of treatment.

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 WEEVILS

Treat if 20 or more larvae are found per sweep and/or 35-50% of the plants show feeding. See the previous section on alfalfa forage for a description of the weevil and damage, and for registered insecticides and rates. Do not use carbaryl or Penncap M on seed fields. Use trichlorfon (Dylox) 1 lb AI/acre or methoxychlor 1.5 lb AI/acre if treatment is needed during bloom. Spray in evening to minimize impact on pollinators.

GRASSHOPPERS

Dimethoate (Cygon, Defend) or carbofuran (Furadan 4F) sprays at prebloom will provide good control of grasshopper nymphs. See previous section on alfalfa forage for description of grasshoppers and damage.

VETCH

Insect management is important in producing vetch seed. Particular care must be taken so that beneficial pollinators are not damaged. Refer to guidelines given in the forage alfalfa section with regard to bee production.

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 vetch seed pods, the larvae feeding on the developing vetch seed.

CONTROL RECOMMENDATIONS FOR VETCH INSECTS

Insect	Insecticide	Amount AI/Acre	Restrictions
Pea Aphid	malathion 57EC	1.5 pts	0 days before harvest.
	ethyl parathion 4EC	0.5 pts	Wait 15 days.
	ethyl parathion 8E	0.25 pts	Wait 15 days.
	methyl parathion 4E	0.5 pts	Wait 15 days.
	methyl parathion 7.5	0.25 pts	Wait 15 days.
Vetch Bruchid (vetch weevil)	malathion 57EC	1.5 pts	0 days before harvest. Temperatures 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 and when adults are numerous.
	methyl parathion 4E	1.0 pts	Wait 15 days.
Armyworms	methyl parathion 4E	0.5-2.5 pts	Wait 15 days.
	methyl parathion 7.5	0.25-1.25 pts	Wait 15 days.
Armyworms, Webworms, and Climbing Cutworms	ethyl parathion 4EC	0.5-1.0 pts	Wait 15 days.
	ethyl parathion 8E	0.25-0.5 pts	Wait 15 days.

POTATO INSECTS

Even a slight amount of feeding injury on 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

FLEA BEETLES

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

REGISTERED FOR CONTROL OF FLEA BEETLES

Insecticide	Rate AI/Acre	Restrictions
aldicarb (Temik 15G)	2.0-3.0 lbs 14.5-23 oz/1000 ft row	Apply at planting according to label directions. Do not harvest within 90 days. Furrow or band 2 lbs in lighter soil, 3 lbs in heavy soil.

phorate (Thimet 20G)	2.0 lbs 11.3 oz/1000 ft row	Band application at planting time. Wait 90 days before harvest. 2 lbs sandy soils, 3 lbs heavy soils.
disulfoton (Di-Syston 15G)	2.0-3.0 lbs 15.0 to 23.0 oz/1000 ft row	Band application at planting. Do not apply within 75 days of harvest. 2 lbs sandy soil, 3 lbs heavy soil.

WIREWORMS

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

REGISTERED FOR CONTROL OF WIREWORMS

Insecticide	Rate AI/Acre	Restrictions
phorate (Thimet 20G)	2.0 lbs 11.3 oz/1000 ft row	Band application at planting. 2 lbs sandy soil, 3 lbs heavy soil.
fonofos (Dyfonate 4E)	4.0 lbs	Preplant broadcast application - incorporate into the top 3-4 inches by discing.
fonofos (Dyfonate 10G)	4.0 lbs	Preplant broadcast application - incorporate into the top 3-4 inches by discing.

CUTWORMS

Cutworms affecting the potato crop include black, dingy, and dark-sided cutworms.

REGISTERED FOR CONTROL OF CUTWORMS

Insecticide	Rate AI/Acre	Restrictions
carbaryl (Sevin 80S)	2.0 lbs	Apply to soil surface when pests first appear. Troublesome where soil cracking occurs.
trichlorfon (Dylox 4LS)	1.0 lb	Use sufficient water to obtain uniform soil coverage.
trichlorfon (Dylox 5% bait)	1.0 lb	
permethrin (Pounce)	0.1-0.2 lb	7 day harvest restriction. See label.

FOLIAR INSECTS

CONTROL RECOMMENDATIONS FOR FOLIAR INSECTS

Insect	Insecticide	Amount AI/Acre	Restrictions
Flea beetle adults	✋ azinphos methyl (Guthion 50WP)	.75 lb	Keep field margin free of weeds. Apply with sufficient water for complete coverage. Do not apply within 7 days of harvest.
	carbaryl (Sevin 80S)	1.0 lb	
	endosulfan (Thiodan 25EC)	1.0 lb	
	✋ fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb	Do not exceed 1.4 lbs AI/ acre/season. Do not graze livestock on treated vines.
	phosmet (Imidan 50WP)	2.0 lb	Do not apply within 7 days of harvest.
	✋ permethrin (Ambush)	0.05-0.2 lb	7 day harvest restriction.
Grasshoppers	dimethoate (Cygon 400)	.5 lb	Apply to hoppers in field margins before they move into fields. Potatoes may be harvested on day of application.
	carbaryl (Sevin 80S)	1.5 lb	
Potato psyllid	carbaryl (Sevin 80WP)	2.0 lb	
	endosulfan (Thiodan 8EC)	1.0 lb	
	✋ fenvalerate (Pydrin 2.4EC)	.05-0.1 lb	Do not graze livestock on treated vines. Do not exceed 1.4 lbs AI/acre/season.
Aphids: Green Peach Potato Buckthorn	dimethoate (Cygon 400)	.5 lb	Apply control when 5 or more aphids are caught in traps.
	✋ methamidophos (Monitor 4)	1.0 lb	Monitor - hazardous to bees & parasites.
	✋ fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb	Do not graze livestock. Do not exceed 1.4 lbs AI/acre/season.
	✋ permethrin (Ambush)	.05-0.2	7 day harvest restriction.
Leafhoppers	carbaryl (Sevin 80S)	1.5 lb	
	phosmet (Imidan 50WP)	2.0 lb	Do not apply within 7 days of harvest.
	✋ fenvalerate (Pydrin 2.4EC)	0.1-0.2 lb	Do not graze livestock on treated vines.

	dimethoate (Cygon 400)	.5 lb	
	✋ permethrin (Ambush)	.05-0.2 lb	7 day harvest restriction.
	✋ permethrin (Pounce)	0.1-0.2 lb	7 day harvest restriction. Do not graze.
Colorado Potato Beetle	carbaryl (Sevin 80S)	1.0 lb	
	✋ fenvalerate (Pydrin 2.4EC)	.05-.1 lb	Do not graze livestock.
	phosmet (Imidan 50WP)	2.0 lb	
	endosulfan (Thiodan 3EC)	1.0 lb	
	✋ permethrin (Ambush)	.05-0.2 lb	7 day harvest restriction.
	✋ permethrin (Pounce)	0.1-0.2 lb	7 day harvest restriction. Do not graze.
Armyworm	carbaryl (Sevin 80S)	2.0 lb	Apply to nearby vegetation before they move into field.
European Corn Borer	✋ azinphos methyl (Guthion 50WP)	.5 lb	Occurs in eastern 2/3 of Nebraska.
	✋ methomyl (Lannate 1.8L)	1.0 lb	
	✋ carbofuran (Furadan 10G)	3.0 lb	
	carbaryl (Sevin 80S)	2.0 lb	
	✋ permethrin (Pounce)	0.1-0.2 lb	7 day harvest restriction. Do not graze.

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, not to exceed 50 pounds, 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 contaimination 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 decontamination. 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 - Active Ingredient
EC - Emulsifiable Concentrate
WP - Wettable Powder
G - Granular
LC - Liquid Concentrate
L - Liquid
- Restricted Use (applicators must have EPA certification)

SP - Soluble Powder
S - Soluble
LS - Liquid Solution
lb - Pound
oz - Ounce
F - Flowable

Metric Conversion Table

English	*Multiply By*	*Metric*
Inch (in)	25.4	Millimeter (mm)
Inch (in)	2.54	Centimeter (cm)
Foot (ft)	0.3	Meter (m)
Ounce (oz)	28	Gram (g *or* gm)
Pound (lb)	0.45	Kilogram (kg)
Ounce per acre (oz/A)	69.2	Gram per hectare (g/ha)
Pound per acre (lb/A)	1.1	Kilogram/hectare (kg/ha)
Gallon (gal)	3.8	Liter (l)
Gallon per acre (gal/A)	9.39	Liter per hectare (l/ha)
Fahrenheit (°F)	°F-32 ÷ 1.8	Celsuis (°C)