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EC85-1509 Field Crop Insect Control Guide for Nebraska Corn and Sorghum

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FIELD CROP INSECT CONTROL GUIDE FOR NEBRASKA CORN AND SORGHUM

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Insect control suggestions in this guide are based on University of Nebraska test results, data from surrounding states, U.S.D.A. recommendations, previous experience and label registrations. Insect control is never perfect. These suggestions are designed to benefit Nebraska farmers when they need control programs. NebGuides and other publications containing additional information on identification, damage, and life cycles are listed under insect headings. They are available by mail order (Write - Bulletins, 104 ACB, University of Nebraska- Lincoln, NE 68583-0918) or from county extension offices.

Too often the choice of a pesticide is based primarily 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 in this circular. No endorsement is implied by the Nebraska Cooperative Extension Service and no discrimination is intended.

POLICY FOR MAKING PESTICIDE SUGGESTIONS

Because the pesticide label is subject to change, producers must be certain that each pesticide selected is currently labeled for its intended use. THE USER IS ALWAYS RESPONSIBLE FOR THE EFFECTS OF PESTICIDE RESIDUES ON HIS CROPS AND LIVESTOCK, AS WELL AS FOR PROBLEMS THAT MIGHT ARISE FROM DRIFT OR MOVEMENT OF THE PESTICIDE FROM HIS PROPERTY TO THAT OF OTHERS. Always read and carefully follow the instructions on the container label.

For further information, contact your local Extension Agent or Extension Entomologist.

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.

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IMPORTANT

Restrictions on pesticide usage are so lengthy it is not practical to list all of them in this circular. It is essential that labels be read and understood before purchasing or using any product to be certain that such use does not result in illegal application, danger to the user or to the environment, or in residues that exceed established tolerances.

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

RESTRICTED USE

Several insecticides listed in this circular are classified RESTRICTED USE by the Environmental Protection Agency. Pesticides may be classified as Restricted Use based on their persistence, toxicity or potential environmental hazards. To purchase and use these materials, EPA certification is required. To obtain the necessary training, contact your local Extension Agent and request a listing of the dates and locations at which training is to be offered.

✋ Compounds listed in this circular and marked with a small circled hand are classified as Restricted Use. These compounds are: carbofuran (Furadan 4F), disulfoton (Disyston), EPN, fenvalerate (Pydrin), fonophos (Dyfonate 4E), lindane, methomyl (Lannate, Nudrin), ethyl and methyl parathion, Penncap-M,and permethrin (Ambush, Pounce). Applications must be made by or under the direct supervision of a certified applicator. Other products may be classified Restricted Use in 1985.

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 or irresponsible 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.

The highly toxic insecticides in this publication are: carbofuran (Furadan 4F), EPN, fonophos (Dyfonate 4E), methomyl (Lannate, Nudrin), ethyl and methyl parathion, phorate (Thimet), propargite (Comite),and terbufos (Counter). Skull and crossbones and the word Poison appear in red on the label of highly toxic materials. Liquid formulations of these products are not recommended for farmer application. However, by observing and using proper precautions, as indicated on the label, farmers should be able to use granular formulations for soil application to control corn rootworms.

Moderately toxic insecticides are: *Bacillus thuringiensis* (Dipel), carbaryl (Sevin), carbofuran (Furadan 15G), chlorpyrifos (Lorsban), diazinon, dimethoate (Cygon), ethoprop (Mocap 15G), fenvalerate (Pydrin), lindane, malathion, oxydemeton-methyl (Metasystox-R), permethrin (Ambush, Pounce), phosmet (Imidan), trichlorfon (Dylox), and trimethacarb (Broot 15G). They must be used with special care. Familiarize yourself with all warnings given on the label.

CHEMIGATION

The term "chemigation" refers to the injection and application of chemicals through irrigation systems. This method, while proven effective when compared with more conventional application techniques, requires proper equipment (including safety devices), an understanding of how to use it properly, and constant monitoring to ensure proper application, safety to others and to the environment. Proper equipment, procedures for calibration and other instructions for application through center pivot systems is provided in two Nebguides - G84-703 (Applying Insecticides

Through Center Pivots) and G73-43 (Anti-Pollution Devices for Applying Chemicals Through Irrigation Systems, Revised August, 1984). Refer to product labels for specific instructions on handling and proper injection procedures, precautions and restrictions.

SOME SUGGESTED FIELD RE-ENTRY PERIODS

Some insecticides have minimum field re-entry times specified on the label. Certainly exposure is a function of the amount of the material deposited on foliage, intimacy or degree of contact with treated plants and time actually spent in the field. Amount of pesticide in a field depends on application rate, timing, and speed of breakdown as influenced by environmental conditions. The following are considered MINIMUM waiting periods for the products listed. DO NOT ENTER FIELDS AFTER TREATMENT UNTIL THE RE-ENTRY PERIOD HAS PASSED.

Thimet 20G - 7 days
ethyl parathion - 48 hrs.
methyl parathion - 48 hrs.
EPN 4EC, 5EC - 24 hrs.
MetaSystox-R - 48 hrs.
Cygon 400 - 48 hrs.
Diazinon AG500, 14G - None specified
Di-Syston 8EC - 24 hrs, 15G - 7 days
Pydrin 2.4 EC - when spray is dry
Lorsban 4E - when spray is dry. 15G -None specified.
Ethion EC - 24 hrs.
Dylox 80SP - 0 days
Pounce 3.2EC - when spray is dry
Dipel 10G - 0 days
Furadan 4F - 14 days, 15G - None on label
Penncap-M - when spray dries
Diazinon 14G - 48 hrs. (5 days in CA)
Dyfonate 20G, 4EC - None on labels
Sevin - all formulations, 0 days.
Comite 6.5 EC - 48 hrs.
Counter 15G - 7 days
Malathion EC - 0 days
Lannate 1.8L, 90SP - 24 hrs.
Imidan 50WP - None
Nudrin 1.8L, 90SP - 24 hrs.

SPRAYED BY MISTAKE?

Vegetable gardens, particularly plantings of sweet corn, are often placed in or adjacent to crop fields that are eventually sprayed with an insecticide. Is the produce then safe to eat? The answer--it is-- IF THE INSECTICIDE IS REGISTERED FOR USE ON THE VEGETABLE AND THE SPECIFIED WAITING PERIOD HAS ELAPSED. Many of the commonly used field crop insecticides are also labeled for some vegetable crops, but not for all of those commonly grown in Nebraska. Our policy is to recommend against anyone using vegetables that are treated with an unlabeled pesticide. It is up to the individual to evaluate the risks and to proceed. A few dollars worth of vegetables are not worth taking any chances, in our opinion. Remember too, that as an applicator of pesticides, it is illegal for you to allow insecticides to drift onto non-target areas adjacent to treated fields.

The following are some sample waiting periods on 5 garden vegetable crops for several insecticides often used on field crops in Nebraska. The list is not complete. You will need to check appropriate labels for any others. If you have any questions regarding accidental treatments, find out which specific pesticide formulation was used, the application rate, target insect and precise time of spraying. Then obtain a copy of the pesticide label and check its listed registrations before making a decision to use the produce.

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

Insecticide	Tomatoes	Peppers	Sweet Corn	Squash, Melons Cucumbers	Cole Crops
Parathion 8E (ethyl)	10	15	12	7-15	7-10
Furadan 4F	NR*	NR	7	NR	NR
Furadan 15G	NR	21	NR	**	NR
Sevin 80S	0	0	0	0	3-14
Cygon 400	7	0	NR	3	3-14
Pounce 3.2 EC	NR	3	1	NR	1
Lorsban 4E	NR	NR	35	30	NR
Thimet 20G	*	NR	*	NR	NR
Counter 15G	NR	NR	30	NR	NR
Pydrin 2.4 EC	1	NR	1	3	3
Diazinon AG500	1	5	0	3-7	5-7
Diazinon 14G	**	**	**	**	**
Dyfonate 4EC	NR	*	*	NR	*
Dyfonate 20G	NR	NR	30	NR	8
DiSyston 8EC	30	NR	28	NR	30-42
DiSyston 15G	30	NR	40	NR	30-42
Malathion EC	1-5	3	5	1-3	3-7
Imidan 50WP	NR	NR	NR	NR	NR
Penncap-M	15	NR	3	NR	21
MetaSystox-R	NR	**	7-21	7-14	3-7
Lannate 1.8L	1-2	10	0	3	1-3
Nudrin 1.8L	1	3	0	1-3	1-3

NR = Not Registered
* = Planting time application only
** = Registered, preharvest interval not indicated on label

TREATMENT GUIDELINES/ECONOMIC THRESHOLDS

These are intended to assist farmers, consultants and other agriculturists in making decisions regarding treatment of pests. They are intended to be interpreted as flexible guidelines, NOT AS RULES THAT APPLY TO EVERY SITUATION. Used conscientiously, they will be a great help in making treatment decisions. However, bear in mind that many variables affect your decision, including level of insects present in the field, anticipated price, relative effectiveness of controls, available equipment and cost and availability of various pesticides. Timing and accuracy of application, plus the effects of weather also determine the ultimate degree of control.

POLICY ON TREATMENT OF FIRST YEAR CORN

We feel that in most cases, first year corn is unlikely to benefit from soil insecticide applications. In fact, crop rotation is still our top recommendation for prevention of the corn rootworms, our most

important pests of corn. We do recommend insecticides where the situation justifies it, and losses in yield due to insect damage are likely to exceed the costs of control. When applied as "insurance" treatments, we believe that the use of soil insecticides is wasteful, and a practice that will lead to higher production costs, greater environmental risks and a shortening of the useful life of important pesticide products. Remember that routine treatment of field corn for rootworms with hydrocarbons in the 1950's led to the development of resistance to chlorinated insecticides such as BHC, aldrin and heptachlor. First year corn is most likely to benefit from a soil insecticide treatment only where corn follows weedy soybeans, bean fields heavily infested with volunteer corn, or destruction of pasture. A planter box seed treatment is recommended for all corn fields (including first year corn) in Nebraska for protection against seed-attacking insects such as wireworms, seed corn beetles and seed corn maggots. Cutworms are best controlled by rescue treatments applied after the plants are up and early damage signs are detected.

CORN INSECTS BELOW GROUND

CORN ROOTWORM LARVAE
(NebGuides G82-597, G76-283, G83-635 and RP98)

Corn rootworm larval damage is most likely to occur in continuous corn production fields. If estimates indicate that 18,000 or more beetles per acre were present on any scouting date during late July and August the previous year (equivalent to 0.75 beetles per plant at a plant population of 24,000 plants per acre), a soil insecticide should be used as a precautionary measure (See NebGuide G83-634). Data from regular field scouting is essential if this prediction is to work effectively. Corn should be scouted from mid-July through early September to have a high degree of confidence in the prediction. Late season scouting was particularly important in 1984, since the beetle emergence was extended. THEREFORE, PLAN TO USE A SOIL INSECTICIDE IN CONTINUOUS CORN IN 1985 IF YOU DO NOT HAVE SCOUTING DATA FOR THE FULL BEETLE ACTIVITY SEASON (THROUGH FIRST FROST OR SEPT. 10, 1984).

First year corn following other crops may be damaged by rootworm larvae if beetles were numerous the previous August and were attracted to flowering weeds in oat stubble, soybeans infested with volunteer corn or sunflower. CROP ROTATION IS AT LEAST 90 PERCENT EFFECTIVE in protecting fields from corn rootworms.

Effectiveness of soil insecticides is reduced if soil remains dry after application, if excessive rainfall occurs, if soils are highly alkaline, or if applied at planting time on early planted corn. Control is more reliable if an insecticide is applied at cultivation time in late May or early June. If corn is to be planted before May 15, it may be best to delay soil insecticide application until first cultivation, before June 10. Cultivation treatment is particularly desirable if soil is alkaline (high pH accelerates decomposition of some insecticides) or if the field has developed a history of control failures when insecticides have been applied at planting.

Many failures to control rootworms can be traced to poor calibration of granular applicators. In many cases, amounts used are below those recommended on the label. REMEMBER THAT LABEL RECOMMENDATIONS ARE BASED ON 40 INCH ROW SPACINGS. If corn is planted in rows narrower than 40 inches, there are more linear feet of row per acre. This means that more insecticide must be applied per acre to obtain the proper rate needed to protect the corn. By calibrating applicators to deliver the suggested amount of granules per 1,000 feet of row, the amount per acre will be correct regardless of row spacing. Refer to the following table when calibrating an insecticide applicator and when planning purchases.

Table I. Amounts (in Pounds) of Four Soil Insecticide Formulations Needed Per Acre at Various Row Spacings To Obtain Correct Rate Per 1000 Row Feet.

Recommended amount of formulated insecticide per 1000 feet of row	Pounds of formulated insecticide needed to cover one acre					
	40 in. Rows	38 in. Rows	36 in. Rows	34 in. Rows	32 in. Rows	30 in. Rows
10% granules 12.24 oz.	10.00	10.51	11.11	11.77	12.48	13.33
14% granules 8.75 oz.	7.15	7.51	7.94	8.42	8.92	9.53
15% granules 8.16 oz.	6.67	7.01	7.41	7.85	8.32	8.88
20% granules 6.12 oz.	5.00	5.26	5.55	5.89	6.24	6.66

In general, soil insecticides are more effective if covered with soil during application. Granules or liquids remaining on the surface may be lost, and poor control may result.

Fertilizer in combination with a soil insecticide must be applied in bands on both sides of the seed furrow at seed level, not in the furrow or below the seed. Placement below seed level is not effective. Seed furrow applications of liquid or granular insecticides for rootworm control are not recommended because some compounds may reduce the stand when in direct contact with germinating seeds. Also, seed furrow placement reduces the effectiveness of any compound because the treated zone is too narrow to protect lateral roots. Some feeding on roots will occur, regardless of material or placement used. When rootworm numbers are high or egg hatch is extended, do not expect complete control.

Leave an untreated strip in each field to evaluate control. Mark untreated rows and return to the field in early July to dig roots for examination. Refer to NebGuide G82-597 to help you evaluate the performance of your soil insecticide.

Do not use leftover soil insecticides on soybeans as crop damage may result. Certain organophosphates may produce a cross reaction and damage beans when planted in fields where herbicides such as Sencor and Lexone (metribuzin) were applied. Further, soybeans are unlikely to need protection from soil insects.

Soil conditions at planting and type of planting equipment used can greatly affect the placement and ultimate performance of soil insecticides. Certain insecticides should not be allowed to drop into the seed furrow or stand reduction may occur. If soil is rough and cloddy and the furrow fails to close properly, the chance of phytotoxicity is increased. Thimet 20G, Dyfonate 20G, Mocap 15G and Broot 15G should not be dropped into the seed furrow. Counter 15G or Furadan 15G may be applied in the seed furrow without stand loss and Lorsban 15G has no phytotoxic effect on germinating seeds when applied as a T-band.

RECOMMENDATIONS FOR REDUCTION OF CORN ROOTWORM LARVAE

A. Rotate corn with other crops.

B. If corn is planted prior to May 15, apply one of the granular insecticides at cultivation time before June 10 and cover with soil at base of plants. If planting time insecticides are used on early-planted corn, Counter 15G, Dyfonate 20G, Lorsban 15G, and Furadan 15G (if there is no prior history of Furadan use) are more likely to provide longer lasting control. Banded treatments are preferred over infurrow applications at planting time.

C. If planting after May 15, apply one of the granular insecticides in a 7-inch band over rows at planting and cover with soil. If corn is listed, apply at cultivation time regardless of planting date.

D. Rescue Treatment - after June 10: Emergency treatment at lay-by time can be made by applying any of the recommended cultivation-time materials to soil at the base of plants. Cover the insecticide with 1 to 2 inches of soil. This treatment will not kill all rootworms present because the insecticide will not thoroughly penetrate the soil. It may help reduce further root damage by establishing a barrier between the rootworms and developing roots. If broadcast applications are made by aircraft, use Counter, Thimet or Furadan granules and cultivate into rows immediately. Note field re-entry periods. Considerable variation in degree of control has occurred where broadcast applications have not been incorporated into the soil.

Insecticide	Amount Formulation Per 1,000 Row Feet	Restrictions
carbofuran (Furadan 15G)	8.16 oz	Field, sweet and popcorn. Planting 1/ cultivation - over plants or basal.
✋ carbofuran (Furadan 4F)	2.5 fl. oz	Field, sweet and popcorn. Suggest basal application at cultivation.
chlorpyrifos (Lorsban 15G)	8.16 oz	Field, sweet, and popcorn. Planting, cultivation over plants or basal.
chlorpyrifos (Lorsban 4E)	2.45 fl. oz	Cultivation. Basal only.
diazinon 14G	8.75 oz	Field, sweet and popcorn. Cultivation only - over plants or basal.
ethoprop (Mocap 15G)	8.16 oz	Field and sweet corn. Planting 2/, cultivation basal only.
fonophos (Dyfonate 20G)	6.12 oz	Field, sweet and popcorn. Planting 2/, cultivation - over plants or basal.
phorate (Thimet 20G)	6.12 oz	Field and sweet corn. Planting 2/, cultivation - basal only.
terbufos (Counter 15G)	8.16 oz	Field, sweet and popcorn. Planting, cultivation - basal or over plants.
trimethacarb (Broot 15G)	8.16 oz	Field and popcorn. Planting only. 2/

✋ Restricted Use

1/ In certain fields the continued use of Furadan has resulted in unreliable control when used at planting. In fields where this has occurred, Furadan can still be applied as a cultivation treatment, but should only be used with caution at planting. In fields where Furadan has never been used, a planting time application should provide control. Just how many years it takes a soil to develop a problem or to "recover" is unknown. We have no Nebraska data to indicate that chemical rotation is justified unless problems have been encountered with the continous use of a single product.

2/ Do not allow granules to fall into seed furrow, as stand reduction may occur.

CUTWORMS
(NebGuide G80-501 and RP98)

Corn following sod, alfalfa, soybeans or small grain stubble or fields with heavy crop or weed residues, or fields with heavy early season weed growth are most likely to be damaged by cutworms. Treatment is justified when one plant out of 20 shows cutworm feeding injury. Early detection is essential. If soil surface is dry or crusted, rotary hoeing immediately before or after application may increase control if soil is not dry more than one inch deep. Generally, rescue treatments are preferred to preventive treatments applied at or prior to planting. The latter have given erratic control, especially where cutworm populations have been high.

RECOMMENDATIONS FOR CONTROL OF CUTWORMS IN CORN WHEN 5% OF PLANTS HAVE BEEN CUT OR HAVE FEEDING INJURY AND CUTWORMS ARE PRESENT.*

✋ fenvalerate (Pydrin 2.4EC).....0.15 lb AI/Acre

chlorpyrifos (Lorsban 4E).....1.0 lb AI/Acre

✋ permethrin (Ambush 2E).....0.1-0.2 lb. AI/Acre

✋ permethrin (Pounce 3.2EC).....0.1-0.2 lb. AI/Acre

*If soil is dry or crusted, follow application immediately with a rotary hoe.

OTHER PRODUCTS REGISTERED
Rates are Active ingredient per Acre

chlorpyrifos (Lorsban 15G).... 1.0 lb banded at planting
trichlorfon (Dylox 80SP)..... 1.0 lb
diazinon (AG500)..... 2.0 lb
carbaryl (Sevin XLR, Sevimol 4) 2.0 lb
*carbaryl (Sevin 20% or 5% Bait) 5-10 lb (20%) or 40 lb (5%)
ethoprop (Mocap 10G)..... 1.0 lb banded at planting
terbufos (Counter 15G)..... 1.0 lb banded or in-furrow
✋ methyl parathion (Penncap M)... 1.0 lb
fonophos (Dyfonate 20G)..... 1.0 lb banded at planting
carbofuran (Furadan 15G)..... 1.0 lb banded or infurrow at planting
chlorpyrifos (Lorsban 4E)..... 1.0 lb preplant broadcast and incorporated

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✋ Restricted Use

*formulation/acre

WIREWORMS AND SEED DESTROYING INSECTS
(RP 98)

First year corn following a small grain in rotation or pasture sod, eco-fallow and early-planted fields are more likely to be damaged. Wireworm beetles are attracted to grasses to deposit eggs. Since wireworms have long life cycles, fields damaged once are likely to be damaged again. A wireworm baiting method is available to detect their presence prior to planting. Planter box seed treatments are recommended for all corn, sorghum and soybean fields in Nebraska. Where serious wireworm problems are anticipated, we suggest an infurrow application of soil insecticide plus a planter box seed treatment.

RECOMMENDATIONS FOR CONTROL OF WIREWORMS, SEEDCORN MAGGOTS, AND SEEDCORN BEETLES IN FIELD CORN:

carbofuran (Furadan 15G)...8.0 oz per 1,000 feet of row in seed furrow for wireworms and seed corn maggots.

terbufos (Counter 15G).....8.16 oz per 1,000 feet of row in seed furrow for maggots, wireworms.

Planter box treatments of diazinon or ✋ lindane. See labels for rates and restrictions.

OTHER PRODUCTS REGISTERED:

fonophos (Dyfonate 20G)....6.12 oz per 1,000 feet of row. Banded. Seed furrow placement will reduce stand.

phorate (Thimet 20G).....6.12 oz per 1,000 feet of row. Banded. Reduction of wireworms only. Seed furrow placement will reduce stand.

ethoprop (Mocap 15G).....8.16 oz per 1,000 feet of row as a 7" band over rows. For wireworm only. Seed furrow placement will reduce stand.

chlorpyrifos (Lorsban 15G) 8.16 oz per 1,000 feet of row in-furrow. For maggot and seedcorn beetle. Use 16.32 oz per 1,000 row feet for wireworms, "T-banded" or in-furrow. See label for specific instructions. Also labeled as 13.5 lb./Acre broadcast treatment prior to planting.

chlorpyrifos (Lorsban 4E) 4 pints preplant broadcast and incorporated.

✋ Restricted Use

WHITE GRUBS (GRUBWORMS)
(RP 98)

There is no effective control for white grubs after infestations in planted fields are detected. Counter and Lorsban are labeled for control of white grubs at planting. They may be useful in fields that need to be replanted because of grubs, or if large numbers of grubs are observed while preparing fields for planting corn.

Insecticide	Rate	Directions
terbufos (Counter 15G)	8.16-16.32 oz formulation/ 1000 ft of row.	Apply in a 7 inch band or in-furrow (low rate only) at planting time.
chlorypyrifos (Lorsban 15G)	8.16-16.32 oz formulation/1000 ft. of row.	Infurrow or T-Band, Preplant broadcast incorporated.
chlorpyrifos (Lorsban 4E)	4.0 pt./acre	Preplant broadcast incorporated

CORN INSECTS ABOVE GROUND

CORN ROOTWORM ADULTS TO PREVENT SILK CLIPPING
(NebGuide G82-613, RP 98)

Corn rootworm beetles occasionally interfere with pollination if there are sufficient beetles to chew silks to husks during the pollen-shedding period. Controls are indicated only when severe silk chewing is occurring at 25-50 percent pollen shed. In an average year, few fields will need to be sprayed to prevent silk clipping by beetles. Beetles are most likely to cause a problem in late-planted or late-silking fields. Delay spraying fields within 2 miles of apiaries, unless absolutely necessary when fields are shedding pollen. Warn beekeepers and apply treatments in late afternoon or evening when fewer bees are foraging. Bees normally collect corn pollen most actively during the morning hours.

REGISTERED TO CONTROL CORN ROOTWORM ADULTS
Rates are active ingredient per acre

chlorpyrifos (Lorsban 4EC).....0.5-1.0 lb
diazinon (AG500).....0.5 lb
✋ disulfoton (Di-Syston 8EC).....0.25 lb
✋ EPN (4EC, 5EC).....0.5 lb
phosmet (Imidan 50WP).....0.5-1.0 lb
malathion (57EC).....1.0 lb
malathion (9.33 ULV).....0.3 lb
✋ parathion (ethyl or methyl).....0.25 lb
carbaryl (Sevin XLR, 80S, Sevimol).....1.0 lb
✋ fenvalerate (Pydrin 2.4EC).....0.1-0.2 lb

✋ Restricted Use

CORN ROOTWORM ADULTS TO REDUCE LARVAE THE NEXT YEAR
(NebGuide G83-635, RP 98)

Controlling rootworm adults to reduce the number of larvae the next season may not be as reliable as soil insecticides because precise timing of control is essential. If this method is used, it should be under the supervision of trained pest management personnel. To have a reasonable chance of success, begin weekly scouting in early July. Control should be applied when there is an average of 0.75 rootworm beetles per plant and 10 percent of the female beetles have mature eggs (0.75 beetles per plant based on a plant population of 24,000 plants per acre or 18,000 beetles per acre). Note that strict use of calendar dates in timing treatment is not recommended since there may be as much as 3 weeks variation in optimum treatment timing from year to year. When this population is first recorded, apply a longer residual control such as Sevin XLR. Residual activity is reduced by overhead irrigation or rainfall after application. If beetles reinfest the field, make a second application when populations reach one beetle per two plants. The cost of two treatments will exceed that of a single soil treatment applied at planting or first cultivation.

DUE TO THE UNUSUALLY LONG EGG HATCH AND EXTENDED BEETLE EMERGENCE PERIOD IN 1984, BEETLE COUNTS ARE UNLIKELY TO BE OF MUCH PREDICTION VALUE UNLESS THEY WERE CONTINUED THROUGH FIRST FROST OR SEPT. 10, 1984. IF YOU DO NOT HAVE FULL SEASON SCOUTING DATA, PLAN TO USE A SOIL INSECTICIDE ON CONTINUOUS CORN FIELDS IN 1985.

CHINCH BUGS
(RP 98)

Preventing chinch bug damage by cultural practices is more reliable than chemical controls. Where possible, do not plant corn into wheat stubble or adjacent to wheat fields. If chemical controls are necessary, apply a suggested insecticide in at least 30 gallons of water per acre. Use drop pipes from sprayer booms, so that spray is directed onto the lower stalks and soil around the plants. Broadcast sprays over plants are not effective. Sprays will not last more than 4 to 7 days. If migrations from adjacent wheat fields are heavy, retreatment may be necessary. Under heavy populations, chemical control may not be satisfactory.

RECOMMENDATIONS FOR CONTROL OF CHINCH BUGS IN CORN

Insecticide	Rate	Directions, Restrictions,
carbaryl (Sevin XLR)	2.0 lb a.i. per acre	Apply as directed spray with at least 40 gallons of water per acre.
chlorpyrifos (Lorsban 4E)	1.0 lb a.i. per acre	Apply as directed spray with at least 40 gallons of water per acre, using ground equipment only. Wait 35 days for grain, 35 days for fodder, 14 days for silage.

✋ fenvalerate (Pydrin 2.4 EC)	0.1-0.2 lb	Apply as directed spray at base of plants. Wait 21 days before harvest.
✋ parathion	0.75 lb a.i. per acre	Aerial application only. Do not apply within 12 days of harvest. Apply only when chinch bugs are exposed.
phorate (Thimet 20G)	6.12 oz form. per 1,000 ft of row	Apply granules at time of cultivation in a band at base of plants just ahead of cultivator shovels so granules are covered with soil as for corn rootworm control. One postemergence application per season. Do not graze or cut for forage within 30 days of treatment.

✋ Restricted Use

EUROPEAN CORN BORER
(NebGuide G75-217, G82-613, RP 98, RP 22)

The decision to treat for European corn borer is a complex one because of the many variables involved - weather, plant maturity, borer survivorship and development, anticipated corn prices, insecticide efficacy, and costs versus anticipated returns. However, enough is known about these variables to help growers make intelligent assessments as to the need for control of each of our two annual generations.

First generation

Because the moth prefers the tallest plants for egg laying, expect heaviest concentrations of first generation borers in earliest planted fields and/or those fields where the corn plants are significantly taller than corn in surrounding fields. However, plan to scout all corn fields for a 2-4 week period following peak moth flight. This time period will generally fall between early June to early July. Also, some varieties of seed corn are more susceptible than others. Ask your seedsman about locally adapted varieties that produce well and carry some resistance to the borer.

FOR FIRST GENERATION, AERIAL AND GROUND APPLICATIONS OF RECOMMENDED GRANULAR INSECTICIDES HAVE BEEN SUCCESSFUL WHILE LIQUIDS HAVE GENERALLY FAILED. University researchers have also achieved excellent control of European corn borer larvae when applying federally approved LIQUID insecticides through overhead center pivot irrigation systems.

INSECTICIDES REGISTERED FOR FIRST GENERATION BORER CONTROL

Insecticide	Rate lb AI/acre	Average % Reduction* (No. years tested)
carbofuran (Furadan 15)	1.0	90% (5)
chlorpyrifos (Lorsban 4E)	1.0 + oil (pivot)	90% (2)
chlorpyrifos (Lorsban 15G)	1.0	79% (6)
terbufos (Counter 15G)	1.0	90% (6)
diazinon 14G	1.0	85% (3)
Dipel 10G (*Bacillus thuringiensis*)	1.0	92% (2)
fenvalerate (Pydrin 2.4EC)	0.15	65% (3)
fonofos (Dyfonate 20G)	1.0	83% (10)
permethrin (Ambush 2EC)	0.15	72% (5)
permethrin (Pounce 3.2EC)	0.15	79% (5)
permethrin (Pounce 3.2EC)	0.15 (pivot)	90% (2)
phorate (Thimet 20G)	1.0	77% (4)

*These data (based on ground application) are summarized from screening studies on first generation borers conducted at the Northeast Research and Extension Center, Concord, NE. Application method (aerial, conventional ground or pivot), timing of application, etc., will influence degree of control. Since the majority of the applications are likely to be aerially applied, these ground application data should be used to estimate RELATIVE product performance, rather than the exact percentage reductions of corn borer larvae to be expected.

To determine the need to treat for first generation borer, examine the corn whorls in each field, noting the percent of total plants infested, and determine the average number of worms per infested stalk. Also, note the location of the worms, since those that are still in the whorl, are controllable but those that have left the whorls and have entered the side of the stalk cannot be controlled. If all have left the whorl it is too late to attempt control. Sample enough plants at enough locations in each field to ensure that sample estimates are representative of the entire field.

To make a decision on first generation treatment, the following information is needed:

1. Average percent infested whorls in the field, also average number of worms per infested plant.
2. Cost per acre of the insecticide application.
3. Anticipated value of the grain per bushel.
4. Estimated percent control given by a particular insecticide.

EXAMPLE:

Let us assume that 50% of the corn plants in a field are infested with an average of 4 worms/infested plant, that final yield expectation is 125 bu/acre, and that corn is worth $2.75/bu. Additionally, let us assume a 5% yield loss for each borer/plant, that insecticide costs are $8.00/acre, and that application costs are another $4.00/acre (Total = $12.00/acre).

1. Calculate the final average number of larvae per plant*
   50% x 4 larvae/infested plant = 2 larvae/plant

2. Calculate potential yield loss if all worms survive
   2 larvae/plant x 5% = 10% loss in yield

3. Calculate potential bushel loss
   10% loss x 125 bu/a yield = 12.5 bu/acre

4. Calculate potential dollar loss
   12.5 bu/acre loss x $2.75/bu = $34.37 loss/acre

5. Calculate the corrected preventable yield loss assuming the insecticide application only controls 75% of the borers**
   $34.75 x 75% = $25.78/acre preventable loss

6. Compare this dollar amount with the application costs
   $25.78 vs. $12.00

7. IF PREVENTABLE LOSS EXCEEDS THE TOTAL COST OF APPLICATION - TREAT AS SOON AS POSSIBLE.

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*Mortality of the larvae from the time of sampling until pupation may be high. Predicting the survivorship of corn borer through the larval stage and cavity formation is dependent upon the environment, plant stage at time of egg hatch and larval feeding, the stage of the larvae when the sampling occurs, predation, etc. Mortality is higher (often 90%+) during the early larval stages, particularly during the first stage, and decreases thereafter. Unfortunately, available data will not support the use of an "average percentage survivorship" in the calculations. This is a limitation when using this method in making a treatment decision and may result in an overestimation of ultimate damage because fewer worms will survive per plant than were estimated at the time of sampling.

**Percentage control expectations will vary depending on timing of application, choice of insecticide, and method of application. An average figure of 75 % reduction is a reasonable expectation assuming a correct and well-timed application.

RECOMMENDATIONS FOR CONTROL OF FIRST GENERATION EUROPEAN CORN BORER

Insecticide	Rate (Form./Acre)	Restrictions (always read label)
carbofuran (Furadan 15G)	6.7 lb	Do not make a foliar application if Furadan 15G was applied at more than 8 ounces per 1000 linear feet of row at planting (6.7 lbs/acre with 40 inch row spacing) at planting. No more than two foliar applications per season. Field corn only.
chlorpyrifos (Lorsban 15G)	6.7 lb	No more than two applications per season. Field, sweet and popcorn.
chlorpyrifos (Lorsban 4E)	1 qt	Lorsban 4E insecticide may be applied through an overhead sprinkler irrigation system. This method of application dictates the use of specific equipment, specific application conditions, accurate calibration, and critical safety precautions. Consult the label for complete directions prior to use. Field, sweet and popcorn.
diazinon 14G	7.0 lb	Labeled on corn.
Dipel 10G (*Bacillus thuringiensis*)	10 lb	No restrictions. Non-toxic to man. Field, sweet, pop and seed corn.
fonofos (Dyfonate 20G)	5.0 lb	Field, sweet and popcorn.
Penncap-M	2 qt	Penncap-M insecticide may be applied through an overhead sprinkler irrigation system. This method of application dictates the use of specific equipment, specific application conditions, accurate calibration, and critical safety precautions. Consult the label for complete directions prior to use. Particularly note the bee hazard statement. Field and sweet corn.

✋permethrin (Pounce 3.2EC)	4 - 8 oz	Pounce 3.2 EC insecticide may be applied through an overhead irrigation system. This method of application dictates the use of specific equipment, specific application conditions, accurate calibration, and critical safety precautions. Consult the label for complete directions prior to use. Field and popcorn.
terbufos1/ (Counter 15G)	6.7 lb	Limit to 2 applications or a single application if more than 8 oz/1000 ft of row were used at planting. Do not enter field until 7 days post-treatment. Do not graze or cut forage within 30 days of treatment.

✋ Restricted Use
1/ Supplemental label subject to change.

ALSO REGISTERED FOR FIRST GENERATION EUROPEAN CORN BORER CONTROL
Rates of material are formulation per acre.

✋Permethrin (Ambush 2EC, 25WP/Pounce 3.2EC).....0.15 lb
✋carbofuran* (Furadan 4F).....1.0 lb
phorate (Thimet 20G).....1.0 lb
✋fenvalerate (Pydrin 2.4EC).....0.15 lb

✋Restricted Use
*Supplemental label subject to change.

SECOND GENERATION

Fields that have green silks and are shedding pollen during the peak period of moth flight are the most susceptible to second generation infestation. To determine the need for second generation ECB control, begin weekly scouting in mid-July, examining the undersides of leaves for white borer egg masses. These masses, usually found on leaves in the middle third of the plant (frequently near the midrib) normally hatch in about 5 days. Each egg develops a black spot just before hatching.

Timing of applications is critical if reasonably good control is to be achieved. The key to control is to time applications when the first egg masses begin to hatch. Best percentage control and best economic return will be achieved when initial egg hatch coincides with the economic threshold of 50% of the plants having an egg mass and plant growth stage is before stage 6 (blister). As the plant matures toward blister stage and beyond, potential economic benefits of an insecticide application rapidly decline. Scout fields regularly, at least once every 3-5 days, especially during the early half of the moth flight period. Accumulations over time of percentages of plants having egg masses are feasible if the interval of the accumulated scouting information is less than 10 days. Accumulations of numbers beyond 10 days allows time for the first observed eggs to hatch and resulting larvae migrate to areas of the plant that are protected from an insecticide application.

Generally, liquid and granular formulations of the same insecticide are equally effective against second generation ECB larvae. However, if other insect pests are present and/or ECB moth populations are high, liquid formulations are preferred over granules because of their broader spectrum of activity, and the added advantage of obtaining some moth control.

BE ALERT FOR POSSIBLE BUILDUP OF SPIDER MITES AFTER INSECTICIDE APPLICATION.

RECOMMENDATIONS FOR CONTROL OF SECOND GENERATION EUROPEAN CORN BORER

Insecticide	Rate (Form./Acre)	Restrictions (always read label)
carbofuran (Furadan 15G)	6.7 lb	Do not make a foliar application if Furadan 15G was applied at more than 8 ounces per 1000 linear feet of row at planting (6.7 lbs per acre, 40 inch row spacing). No more than two foliar applications per season. Field corn only.
carbofuran* (Furadan 4F)	1.5-2 pt	Do not make a foliar application if more than 6.7 lbs of Furadan 15G or 1 quart of Furadan 4F were used per 13,000 linear feet (one acre with 40 inch row space) at planting. No more than two applications per season. Do not apply within 30 days of harvest. Do not apply on seed corn prior to tasseling or rogueing. Do not reenter treated fields within 14 days of application. Field corn only.
chlorpyrifos (Lorsban 4E)	1 qt	In addition to aerial or ground application, Lorsban 4E may be applied through an overhead sprinkler irrigation system. This method of application dictates the use of specific equipment, specific application conditions, accurate calibration and critical safety precautions. Consult the label for complete directions prior to use. Do not apply within 35 days before harvest of grain. Do not apply more than a total of 14 pints of Lorsban 4E per acre per season. Do not allow livestock to graze in treated areas, do not harvest treated corn silage as feed for meat or dairy animals within 14 days after last treatment. Do not feed treated corn fodder to meat or dairy animals within 35 days after last treatment. Field, sweet and popcorn.

diazinon 14G	7.0 lb	Do not feed treated fodder to dairy or beef cattle or sheep for 10 days following application. Corn may be picked immediately.
chlorpyrifos (Lorsban 15G)	6.5 lb	No more than two applications per season. Do not apply within 35 days before harvest of grain. Do not allow livestock to graze in treated areas nor harvest treated corn silage as feed for meat or dairy animals within 14 days after last treatment. Do not feed treated corn fodder to meat or dairy animals within 35 days after last treatment. Field, sweet and popcorn.
✋ fenvalerate (Pydrin 2.4EC)	5.3-10.6 oz	21 days to harvest. Apply as necessary to maintain control but do not exceed 1.0 lb ai/acre per season. Field and sweet corn.
fonofos (Dyfonate 20G)	5.0 lb	Do not apply within 30 days of harvest or feed or graze livestock within 30 days of treatment. Field, sweet and popcorn.
terbufos* (Counter 15G)	6.7 lb	Limited to 2 applications, or a single application if more than 8 oz/1000 ft of row were used at planting. Do not enter field until 7 days post-treatment. Do not graze or cut forage within 30 days of treatment.

✋ Restricted Use

*Supplemental label subject to change.

ALSO REGISTERED

✋ Penncap-M, in addition to conventional application, can be applied through a center pivot irrigation system). Read label relative to bee hazards prior to considering application.

✋ Lannate L & Lannate 90. Both generations, sweet corn only. See label.

✋ Ethyl parathion. Both generations, label states just corn. See label.

GRASSHOPPERS ON CORN
(NebGuide G74-106, RP 98)

Prevent damage to corn by controlling grasshopper nymphs when there are 20 or more immature grasshoppers per square yard in border rows. Control is best accomplished when hoppers are small and confined to grassy margins around fields. In these areas, carbaryl (Sevin), malathion, or fenvalerate (Pydrin) may be used. See labels.

RECOMMENDATIONS FOR CONTROL OF GRASSHOPPERS IN CORN MARGINS:
Rates are active ingredient per acre.

dimethoate (Cygon 400)..... 0.5 lb

✋ carbofuran (Furadan 4F)..... 0.25 lb

REGISTERED FOR GRASSHOPPER CONTROL IN CORN:
Rates are active ingredient per acre.

✋ fenvalerate (Pydrin 2.4EC)..... 0.15 lb
chlorpyrifos (Lorsban 4E)..... 0.5 lb
malathion 5.7EC..... 1.0 lb
✋ parathion..... 0.5 lb
✋ Penncap-M 1/.....0.5 lb
carbaryl (Sevin 80S, XLR, Sevimol 4).... 1.5 lb
diazinon (AG500)..... 0.5 lb
carbaryl (Sevin 20% Bait)..... 5-10 lb bait/acre

✋ Restricted Use

1/ Do not use Penncap-M or Sevin on corn shedding pollen, if beehives are within 2 miles.

FLEA BEETLES
(RP 98)

These insects are small, about 1/16 inch long, shiny black, and are good jumpers. Injury is first noted as a silvery-white appearance on seedlings where beetles have gouged leaf tissues, producing a "scratched" effect. If injury is present and there are 5 or more beetles per plant (4-6 inches tall), treatment is probably necessary. Fewer beetles can injure smaller plants, whereas corn over 6 inches can probably tolerate 5 beetles per plant.

REGISTERED TO CONTROL FLEA BEETLES

Rates are active ingredient per acre unless otherwise noted

terbufos (Counter 15G)..... 8.16 oz/1000 row feet, banded or in seed furrow at planting

carbofuran (Furadan 15G)..... 8.16 oz/1000 row feet, banded or in seed furrow at planting

chlorpyrifos (Lorsban 4E)..... 1.0 lb

diazinon (AG500)..... 0.5 lb

carbaryl (Sevin 80S, XLR, Sevimol 4)..... 1.0 lb

Penncap-M .....0.50-0.75 lb

Restricted Use

WESTERN BEAN CUTWORMS

(NebGuides G76-290, G82-613)

Several factors influence the decision to control this insect, including weather, corn maturity, and time of cutworm infestation. Generally, corn is most attractive to egg laying moths during the late whorl stages and less attractive when the corn is small or when the corn has already pollinated. A chemical control should be used if 8 percent of the plants are infested with newly hatched larvae in tassels and/or eggs on leaves and corn is at least 95 percent tasselled. Poor control is likely if worms have already reached the ear tips. If corn is developing late in relation to the western bean cutworm infestation, the treatment threshold should be raised, since fewer are likely to survive.

Many products used to control western bean cutworms have been shown to increase the risk of spider mite infestations. Fields treated for western bean cutworms should be watched closely for increasing mite populations.

RECOMMENDATIONS FOR CONTROL OF WESTERN BEAN CUTWORMS ON CORN:

Rates are active ingredient per acre.

carbaryl (Sevin XLR, 80S, Sevimol 4)..... 2.0 lb

chlorpyrifos (Lorsban 4E*)..... 1.0 lb

carbofuran (Furadan 4F)..... 1.0 lb

fenvalerate (Pydrin 2.4EC)..... 0.1 lb

methyl parathion + EPN..... 0.5 lb

* Lorsban 4E may be applied through an overhead sprinkler system. Follow label directions carefully.

OTHER PRODUCTS REGISTERED FOR WESTERN BEAN CUTWORMS:

Penncap-M .....0.5-1.0 lb

(See label statement with regard to bee hazard)

permethrin (Pounce 3.2EC).....0.1-0.2 lb

Not to be used if ear is visible.

SPIDER MITES
(NebGuide G75-50)

Two species of spider mites, the two-spotted spider mite and the Banks grass mite, can cause damage to corn. The two-spotted spider mite generally builds up later in the season and is more difficult to control with registered products. Spider mites are most likely to develop economic populations in fields that are moisture stressed during June and early July, particularly if weather is hot and dry. Mite buildup can occur even in irrigated fields, especially if irrigation is delayed during stress periods prior to blister stage of corn. Other fields likely to develop mite problems are fields that have received foliar applications of insecticides for European corn borers, western bean cutworms or other pests and those situated next to ripening wheat. Watch these situations closely for rapid mite increase. Plan to treat immediately if 1 lower leaf is yellowing from spider mite damage and mite colonies are present up to the ear zone. Corn that has dented will not likely benefit from treatment for mites.

REGISTERED FOR CONTROL OF SPIDER MITES ON CORN:
Rates are active ingredient per acre.

✋ carbofuran (Furadan 4F)	1.0 lb
dimethoate (Cygon 400)	0.5 lb
disulfoton (Di-Syston 15G)	1.0 lb
✋ disulfoton (Di-Syston 8EC)	1.0 lb
oxydemetonmethyl (Metasystox-R 2EC)	0.5 lb
phorate (Thimet 20G)	0.0 lb
propargite (Comite 6.55EC)	1.6 lb
terbufos (Counter 15G)	1.0 lb

✋ Restricted Use

ARMYWORMS
(NebGuides G82-613, G82-615, RP 98)

Control when migration from adjacent grassy areas, pastures or fields is sufficient to damage margin rows of corn, or when infestations are consuming lower leaves before hard dent stage. Armyworms hide under clods or debris by day and feed by night. Applications are likely to be most effective if put on in evening or early morning.

RECOMMENDATIONS FOR CONTROL OF ARMYWORMS IN CORN:
Rates are active ingredient per acre.

chlorpyrifos (Lorsban 4E)..... 1.0 lb

✋ methomyl (Lannate 1.8EC, Nudrin 1.8EC).. 0.45 lb

carbaryl (Sevin XLR, 80S, Sevimol 4).... 1.5 lb

✋ fenvalerate (Pydrin 2.4 EC).....0.1-0.2 lb

malathion 57EC..... 1.25 lb

✋ permethrin (Ambush 2E,.....0.1-0.2 lb
Pounce 3.2EC)

✋ ethyl parathion..... 0.5 lb

✋ Penncap-M .....0.5-0.75 lb

ALSO REGISTERED FOR ARMYWORM CONTROL:

*carbaryl (Sevin 20% Bait)..... 5-10 lb/acre
trichlorfon (Dylox 80SP)..... 1.0 lb

✋ Restricted Use
*formulation/acre

SORGHUM INSECTS

APHIDS AND GREENBUGS

Corn leaf aphids (referred to as "aphids") rarely cause economic damage to grain sorghum grown under Nebraska conditions. Treatments applied for this insect would seldom result in a yield increase that would pay for the cost of treatment - EXCEPT in times of severe drought stress after heading.

Greenbugs are frequent pests in Nebraska sorghum. These small insects are bright green, with a dark green stripe down the back. Typically they feed on the undersides of leaves on larger plants. Seedling milo can be treated at planting time with soil systemics which typically protect the plants until about early July. These treatments do not usually prevent mid-to-late season buildup, which normally peaks in late July or early August. Seedling sorghum occasionally is infested with greenbugs in late May or early June. If colonies are developing on 10-20 percent of the seedling plants insecticide application should be considered. Unless plants are threatened in the seedling stage, it may be best to withhold treatment until early July, and to spray when greenbug colonies are small. Foliar treatments applied around July 7 have given good control and have often prevented midseason damage. The application should be made when colonies are smaller than a quarter and before yellowish to reddish feeding spots have developed on the top of the lowest leaves.

RECOMMENDED FOR CONTROL OF GREENBUGS ON SORGHUM:
Rates are active ingredient per acre.

✋ carbofuran (Furadan 4F)	0.5 lb
chlorpyrifos (Lorsban 4E)	0.5 lb
diazinon (AG500)	0.5 lb
dimethoate (Cygon)	0.5 lb
disulfoton (Di-Syston 15G)	1.0 lb
✋ disulfoton (Di-Syston 8EC)	0.5 lb
✋ fonofos (Dyfonate 4E)	1.0 lb
malathion 57EC	1.0 lb
oxydemetonmethyl (Metasystox-R 2SC)	0.5 lb
✋ parathion(ethyl only)	0.5 lb
phorate (Thimet 20G)	1.0 lb

✋ Restricted Use

REGISTERED FOR PLANTING TIME APPLICATION:
Rates are formulation per 1000 feet of row

carbofuran (Furadan 15G)	8.16 oz banded or in-furrow
disulfoton (Di-Syston 15G)	8.15 oz banded only
phorate (Thimet 20G)	6.12 oz banded only
terbufos (Counter 15G) 1/	8.16 oz banded only

1/ Registered for use only on grain sorghum

CAUTION: Since certain sorghum varieties may be sensitive to organophosphate insecticides, Metasystox-R should be applied to a small area and observed for a few days to determine if any crop injury will occur. Parathion may also cause spotting, especially if applied when temperatures are high.

WIREWORMS, SEEDCORN MAGGOT AND SEEDCORN BEETLE

Planter box seed treatment with ✋ lindane or diazinon. Follow package directions for amounts and restrictions.

CHINCH BUGS
(RP 98)

Preventing chinch bug damage to sorghums by cultural practices is more reliable than chemical controls. Do not plant sorghums following wheat stubble, or adjacent to winter wheat. Chinch bugs do not feed on legumes, so soybeans are ideal alternatives for sorghum fields with high probability of chinch bugs.

Research in Nebraska and Kansas indicates that Furadan granules applied in the seed furrow at time of planting provides the longest

lasting control of chinch bugs moving into sorghums from adjacent wheat. Under conditions of high populations, soil insecticides are not highly effective and may need to be supplemented with foliar sprays. Also, these sprays may need to be repeated during the period of migration.

RECOMMENDATIONS FOR CHINCH BUG CONTROL IN SORGHUM

Insecticide	Rate	Directions, Restrictions, Comments
		AT PLANTING
✋ carbofuran (Furadan 4F, 15G)	8.16 oz granules or 2.45 fl oz 4F per 1000 ft of row	Place in-furrow with seed. Should give 3 to 4 weeks protection.
		POSTEMERGENCE
carbaryl (Sevin XLR, 80S, Sevimol 4)	2.0 lbs a.i. per acre	Apply as directed spray with at least 40 gallons of water per acre.
✋ carbofuran (Furadan 4F)	0.5 lb a.i. per acre	Apply as directed spray with at least 30 gallons of water per acre. Do not make more than two applications of Furadan per season, including planting time application. Do not apply after heads form. Do not harvest within 30 days of application.
chlorpyrifos (Lorsban 4E)	0.5 lb a.i. per acre	Apply as directed spray with at least 40 gallons of water per acre, using ground equipment only. Do not apply more than 12 oz of Lorsban 4E per season. The treated crop is not to be used for forage, fodder, hay or silage within 28 days after treatment. Do not treat sweet varieties of sorghum.
✋ ethyl parathion	0.75 lb a.i. per acre	Aerial application only. Do not apply within 12 days of harvest. Apply only when chinch bugs are exposed.
phorate (Thimet 20G)	6.12 oz form./ 1000 ft of row	Apply at base of plants at cultivation and cover with soil. One application per season.

✋ Restricted Use

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

Restricted Use (applicators must have EPA certification)

Metric Conversion Table

English	*Multiply by*	*Metric*
Foot (ft)	0.254	Meter (m)
Acre (A)	0.4	Hectare (ha)
Mile (mi)	1.6	Kilometer (km)
Fluid Ounce (fl oz)	29.57	Milliliter (ml)
Pint (pt)	0.473	Liter (l)
Quart (qt)	0.946	Liter (l)
Gallon (gal)	3.784	Liter (l)

1985

PLANT DISEASE, WEED AND INSECT INFORMATION

Plant Pathology, Weed Science, and Insect newletters have been combined into one mailing package by the Nebraska Cooperative Extension Service. Because plant diseases, insect infestations and weeds are often closely related, you receive timely information on all three of these areas. A minimum of 24 issues of the newsletter packet will be produced and mailed during the season starting in March, 1985.

The main thrust of the packet will be on crops, but will also include advisories on lawn and garden problems as warranted.

Benefits of your subscription will include:

*Weekly update during the growing season on plant pest control and management.

*Recommendations from Extension Weeds Specialists John Furrer and Alex Martin.

*Recommendations from Extension Entomologists Dave Keith and Fred Baxendale.

*Recommendations from Extension Plant Pathologists John Watkins and Dave Wysong.

*Information on regulations, chemicals and other pest control procedures.

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