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EC83-1509 Insect Control Guide for Corn and Sorghum in Nebraska

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INSECT CONTROL GUIDE FOR CORN AND SORGHUM

NEBRASKA

Agricultural Extension Entomologists
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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 more specific information are listed under insect headings. They are available from county extension offices.

Often the choice of a pesticide is based on its cost. Several factors should be considered in the decision, including efficacy for the particular pest, 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.

Recommendations enclosed in boxes indicates that these compounds may provide more consistent or efficient results based on University of Nebraska and other states' research and field experience. This does not indicate that these products are the only ones that should be used or that other products are not effective.

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 here. It is essential that labels be examined 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: Amaze 20G, Furadan 4F, Di-Syston emulsifiable concentrates greater than 65%, Dyfonate emulsifiable concentrates greater than 44%, methomyl, ethyl parathion, methyl parathion, Penncap M, Penncap E, Ambush,
Pounce and Pydrin. Application of these products must be made by, or under the direct supervision of a certified applicator. Other products may be classified restricted use in 1983.

TOXICITY OF INSECTICIDES

All insecticides are poisonous and must be used with caution. They should always be stored in the original container out of the reach of children, uninformed adults and livestock. It is very important that the labels of every insecticide be studied until they are understood. Follow these completely to avoid accidental poisoning or death, and to prevent illegal residues in crops.

The highly toxic insecticides in this publication are ethyl parathion, Furadan 4F, methyl parathion, EPN, Di-Syston, Thimet, Counter, Dyfonate and Amaze. 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 only if special precautions are taken.

Moderately toxic insecticides are Diazinon, Furadan 10G, Mocap 10G, Lorsban, Sevin, Malathion, dimethoate, Metasystox-R, toxaphene, Ethion, Triathlon 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 1983. Visit with your county agricultural agent before making the final decision of which insecticides to use.

INSECTS BELOW GROUND

CORN ROOTWORM LARVAE
(NebGuides G76-206 and G82-643)

Corn rootworm larval damage is most likely to occur in continuous corn production fields. If one or more beetles per plant were observed the previous late July and August, a soil insecticide is indicated. Corn following other crops may be damaged by rootworm larvae if beetles in adjacent corn fields were numerous the previous August and were attracted to flowering weeds, sorghums, or sunflowers. Crop rotation is the most effective prevention for corn rootworms in over 90% of first year fields. In northeast Nebraska, first year corn following oats is occasionally severely damaged by northern 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, since high pH accelerates decomposition of insecticides.

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 per 1,000 feet of row, the amount per acre will be correct regardless of row spacing. Refer to the following table when calculating an insecticide purchase order and when applicators are calibrated.

| Table 2. Amounts of formulated insecticide needed per acre at various row spacings based on the recommended rate of ozs/1000 ft of row for four different percentage granular formulations of rootworm insecticides. |
|---|---|---|---|---|---|---|
| Recommended amount of formulated insecticide per 1000 feet (300 m) of row | Pounds of formulated insecticide needed to cover one acre (kg/ha) |
| | 40 inch (1 m) | 38 inch (96.5 cm) | 36 inch (91.4 cm) | 34 inch (86.4 cm) | 32 inch (81.3 cm) | 30 inch (76.2 cm) |
| rows | rows | rows | rows | rows | rows | rows |
| 10% Granules - 12.24 oz (342.72 g) | 10.00 | 10.51 | 11.11 | 11.77 | 12.48 | 13.33 |
| 14% Granules - 8.75 oz (245 g) | 7.15 | 7.51 | 7.94 | 8.42 | 8.92 | 9.53 |
| 15% Granules - 8.16 oz (228.48 g) | 6.67 | 7.01 | 7.41 | 7.85 | 8.32 | 8.88 |
| 20% Granules - 6.12 oz (171.36 g) | 5.00 | 5.26 | 5.55 | 5.89 | 6.24 | 6.66 |

It is essential that insecticides be covered with soil. Granules or liquids remaining on the surface are lost and poor control is likely.

Fertilizer in combination with a soil insecticide must be applied in bands on each side 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 untreated strips to evaluate control.
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 between May 25 and June 10 and cover with soil at base of plants. If insecticides are used on early planted corn, Counter 15G, Dyfonate 20G, Amaze 20G, Lorsban 15G, and Furadan 15G (if there is no prior history of Furadan use) are more likely to provide economic control.

C. If planting after May 15 apply one of the granular insecticides in a 7-inch band over rows 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 cultivation time granules to the 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 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 or Furadan granules and cultivate into rows immediately.

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Amount Formulation Per 1,000 Feet</th>
<th>Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>carbofuran (Furadan 15G)</td>
<td>8.16 oz</td>
<td>Field, sweet and popcorn. Planting 1/2, cultivation - over plants or basal.</td>
</tr>
<tr>
<td>chlorpyrifos (Lorsban 15G)</td>
<td>8.16 oz</td>
<td>Field, sweet and popcorn. Planting, cultivation over plants or basal.</td>
</tr>
<tr>
<td>diazinon 14G</td>
<td>8.75 oz</td>
<td>Field, sweet and popcorn. Cultivation only - over plants or basal.</td>
</tr>
<tr>
<td>ethoprop (Mocap 10G)</td>
<td>12.24 oz</td>
<td>Field and sweet corn. Planting 2/, cultivation basal only.</td>
</tr>
<tr>
<td>fonophos (Dyfonate 20G)</td>
<td>6.12 oz</td>
<td>Field, sweet and popcorn. Planting 2/, cultivation - over plants or basal.</td>
</tr>
<tr>
<td>isofenphos (Amaze 20G)</td>
<td>6.12 oz</td>
<td>Field, sweet and popcorn. Planting, cultivation - basal only. Wait 75 days before harvest.</td>
</tr>
<tr>
<td>phorate (Thimet 20G)</td>
<td>6.12 oz</td>
<td>Field and sweet corn. Planting 2/, cultivation over plants or basal.</td>
</tr>
<tr>
<td>terbufos (Counter 15G)</td>
<td>8.16 oz</td>
<td>Field, sweet and popcorn. Planting, cultivation - basal or over plants.</td>
</tr>
</tbody>
</table>
1/ In certain locations the continued use of Furadan has resulted in unreliable control. It is advisable to use one of the other listed compounds if application is at planting time, and Furadan has been used previously.

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

Insecticides thus marked are currently on the restricted use list.

CUTWORMS
(NebGuide G80-501)

Corn following sod, alfalfa, soybeans or small grain stubble or fields with heavy crop or weed residues 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. Crusting, or dry surface soil will reduce efficacy of control. If surface is dry or crusted, rotary hoeing immediately before or after insecticide application may increase control if soil is not dry more than one inch deep.

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

fenvalerate (Pydrin)........0.15 pound AI/acre
chlorpyrifos (Lorsban 4E)....1 pound AI/acre

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

OTHER PRODUCTS REGISTERED:
Amounts Active Ingredient per Acre

chlorpyrifos (Lorsban 15G).......1 pound banded at planting
trichlorfon (Dylox)..............1 pound
diazinon.........................2 pounds
carbaryl (Sevin)..................2 pounds
carbaryl (Sevin 5% bait).......20-40 pounds formulation per acre
ethoprop (Mocap 10G)............1 pound banded at planting

WIREWORMS AND SEED DESTROYING INSECTS

First year corn, eco-fallow and early planted fields are more likely to be damaged.
RECOMMENDATIONS FOR CONTROL OF WIREWORMS, SEEDCORN MAGGOTS, AND SEEDCORN BEETLES IN CORN:

- **terbufos** (Counter 15G) ........ 8 oz per 1,000 feet of row in seed furrow
- **carbofuran** (Furadan 15G) .... 8.6 oz per 1,000 feet of row in seed furrow
- Planter box treatments of diazinon, lindane or Lorsban (chlorpyrifos). See label for rates and restrictions.

OTHER PRODUCTS REGISTERED:

- **ethoprop** (Mocap 10G) ......... 12 oz per 1,000 feet of row as a 7" band over rows. Seed furrow placement will reduce stand.
- **chlorpyrifos** (Lorsban 15G) .... 8 oz per 1,000 feet of row.

WHITE GRUBS (GRUBWORMS)

There is no effective control for white grubs after infestations in planted fields are detected. Counter is labeled for reduction of white grubs, and Amaze for low to moderate populations used as a 7 inch band at planting. They may be useful only in fields that need to be replanted because of grubs, or if large numbers of grubs are observed while preparing fields for planting corn.

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Rate</th>
<th>Directions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>isofenphos</strong> (Amaze 20G)</td>
<td>6 ounces formulation/1000 feet of row</td>
<td>Apply in a 7 inch band at planting and cover with soil.</td>
</tr>
<tr>
<td><strong>terbufos</strong> (Counter 15G)</td>
<td>16 ounces formulation/1000 feet of row</td>
<td>Apply in a 7 inch band at planting and cover with soil.</td>
</tr>
</tbody>
</table>

Restricted Use

INSECTS DAMAGING CORN ABOVE GROUND

CORN ROOTWORM ADULTS TO PREVENT SILK CLIPPING

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 if fields are shedding pollen. Warn beekeepers within 2 miles of the field to be sprayed and apply treatments in late afternoon or evening when bees are not foraging. Bees normally collect corn pollen during the morning hours.

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

- diazinon ........................................... 8 oz
- disulfoton (Di-Syston) ............................ 4 oz
- EPN .................................................. 6 oz
- phosmet (Imidan) ................................. 8 oz
- malathion ......................................... 1 lb
- malathion ULV .................................... 4 oz
- parathion (ethyl or methyl) ................. 4 oz
- carbaryl (Sevin) ................................. 1 lb

Restricted use

CORN ROOTWORM ADULTS TO REDUCE LARVAE THE NEXT YEAR
(NebGuide G82-634)

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, and because long residual chemicals are not available, more than one application of an insecticide may be necessary. If this method is used, it should be under the supervision of trained pest management personnel. To have a reasonable chance of success, begin scouting in early July. Control should be applied when there is an average of one rootworm beetle per plant and 10 percent of the female beetles have mature eggs. When this population is first recorded, apply control. If beetles recur, 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.

CHINCH BUGS

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, reapplication may be necessary. Under heavy populations, chemical control may not be satisfactory.
RECOMMENDATIONS FOR CONTROL OF CHINCH BUGS IN CORN

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Rate</th>
<th>Directions, Restrictions, Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AT PLANTING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>carbofuran</td>
<td>1.2 oz a.i.</td>
<td>Place in-furrow with seed. Should give 3 to 4 weeks protection.</td>
</tr>
<tr>
<td>(Furadan 15G)</td>
<td>per 1,000 ft.</td>
<td></td>
</tr>
<tr>
<td><strong>POSTEMERGENCE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>carbaryl (Sevin 80W, Sevin XLR, Sevimol)</td>
<td>2 lbs a.i. per acre</td>
<td>Apply as directed spray with at least 40 gallons of water per acre.</td>
</tr>
<tr>
<td>chlorpyrifos</td>
<td>8 oz a.i.</td>
<td>Apply as directed spray with at least 40 gallons of water per acre, using ground equipment only. Do not apply more than 24 oz of Lorsban 4E by postemergence application per season. Do not allow livestock to graze in treated areas or feed treated corn silage, fodder or grain to meat or dairy animals within 50 days after last treatment.</td>
</tr>
<tr>
<td>(Lorsban 4E)</td>
<td>per acre</td>
<td></td>
</tr>
<tr>
<td>parathion</td>
<td>12 oz a.i.</td>
<td>Aerial application only. Do not apply within 12 days of harvest. Apply only when chinch bugs are exposed.</td>
</tr>
<tr>
<td></td>
<td>per acre</td>
<td></td>
</tr>
<tr>
<td>phorate (Thimet 20G)</td>
<td>1.2 oz a.i.</td>
<td>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. Do not make more than one postemergence application per season. Do not graze or cut for forage within 30 days of treatment.</td>
</tr>
<tr>
<td></td>
<td>per 1,000 ft.</td>
<td></td>
</tr>
</tbody>
</table>

Restricted Use

EUROPEAN CORN BORER
(NebGuide G75-217)

**FIRST GENERATION** - The need for insecticide treatment for first generation is determined by examining whorls. Treat if 50 percent of the corn plants on dryland; 35 percent on irrigated; 25 percent on popcorn; or 5-10 percent on seed fields show shotholes and larvae are present in whorls. Heaviest first brood borer activity is expected in earliest planted fields, or fields planted to susceptible varieties. Ask your seedcorn dealer if a variety is available for your area that produces high yields and has some resistance to European corn borers. If borers have entered the stalks, control is impossible.

**SECOND GENERATION** - It is difficult to determine when control of second generation borers will be profitable. Fields that have green silks during second generation moth flight in late July and August are especially attractive to moths for egg laying. When 50% of plants have egg masses, small borers in leaf axils,
or a combination of egg masses and small borers, control may be feasible. Where possible, harvest heavily infested fields early to reduce field losses. Second generation borers are most serious in late planted or long season hybrids.

**RECOMMENDATIONS FOR CONTROL OF EUROPEAN CORN BORERS:**

Amounts are formulation per acre.

- carbofuran (Furadan 15G) .................. 6.5 lbs
- chlorpyrifos (Lorsban 15G) .................. 6.5 lbs
- diazinon 14G .................................. 7 lbs
- fonofos (Dyfonate 20G) ........................ 5 lbs

**REGISTERED FOR CONTROL OF EUROPEAN CORN BORERS:**

Amounts are formulation per acre.

- carbofuran (Furadan 4F) ................... 1 qt
- phorate (Thimet 20G) ....................... 5 lbs ¹

¹ Restricted Use

¹ First brood only

Sevin, Lorsban, diazinon, EPN, Pydrin and permethrin are registered as sprays. Spray applications with most materials have not been effective. Permethrin (Ambush and Pounce) will be recommended if registration is granted. The use of Thimet granules may result in erratic control.

**GRASSHOPPERS ON CORN**


Prevent damage to corn by controlling grasshopper nymphs when there are 20 or more immature grasshoppers per square yard in margins around fields.

**RECOMMENDATIONS FOR CONTROL OF GRASSHOPPERS ON CORN:**

Amounts are active ingredient per acre.

- dimethoate (Cygion 400) ..................... 8 oz
- carbofuran (Furadan) .......................... 4 oz

**REGISTERED FOR GRASSHOPPER CONTROL IN CORN:**

Amounts are active ingredient per acre.

- fenvalerate (Pydrin) ......................... 0.15 lbs
- chlorpyrifos (Lorsban) ....................... 0.8 oz
- malathion ...................................... 1 lb
- parathion ...................................... 0.8 oz
- Pennycap M ¹/................................. 0.8 oz
- carbaryl (Sevin 80) ¹/ ..................... 2 lbs
- carbaryl (Sevimol) ¹/ ..................... 1.5 lbs

¹/ Do not use Pennycap M or Sevin on corn shedding pollen, if beehives are within 2 miles.
WESTERN BEAN CUTWORMS
(NebGuide G76-290)

Several factors influence the decision to control western bean cutworms, including weather, corn maturity, and time of western bean cutworm infestations. 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. Generally, 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:
Amounts are active ingredient per acre.

- carbaryl (Sevin) .................. 2 lbs
- fenvalerate (Pydrin) .............. 0.1 lb
- methyl parathion + EPN ........... 8 oz

Permethrin (Ambush and Pounce) will be recommended if registration is granted.

SPIDER MITES
(NebGuide G75-50, 1981)

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 other pests or 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 in the ear zone. Corn that has dented will not likely benefit from the treatment.

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

- dimethoate (Cyon 400) ............ 0.8 oz
- disulfoton (Di-Syston 15G) ......... 1 lb
- disulfoton (Di-Syston EC) ......... 1 lb
- oxydemetonmethyl (Metasystox-R) .... 8 oz
- phorate (Thimet 20G) ............... 1 lb
- carbophenothion (Triathlon) ....... 1 lb
- propargite (Comite) ............... 0.8 lb

* Restricted Use
ARMYWORMS

Control when migration from adjacent grassy fields is sufficient to damage margin rows, or when field infestations are consuming lower leaves before hard dent stage. Develop in fields with grassy weeds.

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

chlorpyrifos (Lorsban) ..................0.5 lb
methomyl (Lannate, Nudrin) .........6 oz
carbaryl (Sevin) ......................1.6 lbs
parathion ................................0.5 lb

SORGHUM INSECTS

GREENBUGS AND CORN LEAFAPHIDS
(NebGuide G76-266, 1982)

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.

Greenbugs have frequently caused serious yield losses in Nebraska grain sorghum since 1968. For a discussion of treatment guidelines on susceptible and resistant grain sorghum hybrids, refer to NebGuide G76-266 (revised 1981), available at your county extension office.

Certain sorghum varieties may be sensitive to organic phosphate insecticides. Red or brown spots where spray droplets contact leaves frequently occur. Usually these are not serious. Sensitivity can be determined by spraying a small area of a field and observing for several days for crop injury.

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

diazinon ..................................8 oz
dimethoate (Cython) ..................6 oz
disulfoton (Di-Syston 15G) ..........1 lb
disulfoton (Di-Syston EC) ..........8 oz
fonofos (Dyfonate) .................1 lb
carbofuran (Furadan 4F) ..........8 oz
malathion ................................1 lb
oxydemetonmethyl (Metasystox-R) ..8 oz
parathion ................................8 oz
Penncap E ................................8 oz
phorate (Thimet 15G) ..............1 lb

Restricted Use
REGISTERED FOR PLANTING TIME APPLICATION:
Amounts are formulation per 1000 feet of row.

- carbofuran (Furadan 15G)..............8.16 oz
- disulfoton (Di-Syston 15G)............8.16 oz
- phorate (Thimet 20G)..................6.12 oz
- terbufos (Counter 15G) 1/............8.16 oz

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.

WIREWORMS, SEEDCORN MAGGOT AND SEEDCORN BEETLE

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

CHINCH BUGS

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 sorghums in high chinch bug probability fields.

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, chemical controls are not highly effective.

RECOMMENDATIONS FOR CHINCH BUG CONTROL IN SORGHUM:

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Rate</th>
<th>Directions, Restrictions, Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>carbofuran (Furadan 4F, 15G)</td>
<td>1.2 oz a.i. per 1,000 ft of row</td>
<td>AT PLANTING: Place in-furrow with seed. Should give 3 to 4 weeks protection.</td>
</tr>
<tr>
<td>carbaryl (Sevin)</td>
<td>2 lbs a.i. per acre</td>
<td>POSTEMERGENCE: Apply as directed spray with at least 40 gallons of water per acre.</td>
</tr>
<tr>
<td>carbofuran (Furadan 4F)</td>
<td>8 oz a.i. per acre</td>
<td>Apply as directed spray with at least 40 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.</td>
</tr>
</tbody>
</table>
chlorpyrifos  
(Lorsban 4E)  
8 oz 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  
12 oz 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)  
1.2 oz a.i.  
per 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 or 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
lb - Pound
oz - Ounce
F - Flowable

- Restricted Use (applicators must have EPA certification

<table>
<thead>
<tr>
<th>English</th>
<th>Multiply By</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inch (in)</td>
<td>2.54</td>
<td>Millimeter (mm)</td>
</tr>
<tr>
<td>Inch (in)</td>
<td>2.54</td>
<td>Centimeter (cm)</td>
</tr>
<tr>
<td>Foot (ft)</td>
<td>0.3</td>
<td>Meter (m)</td>
</tr>
<tr>
<td>Ounce (oz)</td>
<td>28</td>
<td>Gram (g or gm)</td>
</tr>
<tr>
<td>Pound (lb)</td>
<td>0.45</td>
<td>Kilogram (kg)</td>
</tr>
<tr>
<td>Ounce per acre (oz/A)</td>
<td>69.2</td>
<td>Gram per hectare (g/ha)</td>
</tr>
<tr>
<td>Pound per acre (lb/A)</td>
<td>1.1</td>
<td>Kilogram/hectare (kg/ha)</td>
</tr>
<tr>
<td>Gallon (gal)</td>
<td>3.8</td>
<td>Liter (l)</td>
</tr>
<tr>
<td>Gallon per acre (gal/A)</td>
<td>9.39</td>
<td>Liter per hectare (l/ha)</td>
</tr>
<tr>
<td>Fahrenheit (°F)</td>
<td>°F - 32</td>
<td>Celsius (°C)</td>
</tr>
</tbody>
</table>