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EC87-1509 Field Crop Insect Control Guide for Nebraska Corn and Sorghum

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Insect control suggestions in this circular are based on University of Nebraska test results, data from surrounding states, USDA recommendations, previous experience, and label registrations. These suggestions are designed to guide Nebraska farmers when they select an insect control program. NebGuides and other publications containing additional information on insect identification, damage, and life cycles are referenced under insect headings and are available by mail order (Write - Bulletins, 104 ACB, University of Nebraska-Lincoln, NE 68583-0918) or from Cooperative Extension Service Offices.

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<td>12</td>
</tr>
</tbody>
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POLICY FOR MAKING PESTICIDE SUGGESTIONS

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

THE USER IS RESPONSIBLE FOR THE EFFECTS OF PESTICIDE RESIDUES ON CROPS AND LIVESTOCK, AS WELL AS PESTICIDE DRIFT AND CONTAMINATION. This publication does not supersede label information. Always read and carefully follow the instructions on the container label. For current information, contact your local Cooperative Extension Service Office.

The use of trade names in this circular is not to be considered an endorsement by the Nebraska Cooperative Extension Service, and no discrimination is intended.

TOXICITY OF INSECTICIDES

(NebGuides G85-758, G84-715, G79-460, G79-472, G79-473, G79-479)

All insecticides are poisonous and must be used with caution. Always store them in their original containers out of the reach of children, unauthorized personnel, and livestock. Skull and crossbones and the words Danger/Poison appear in red on the label of highly toxic materials. Liquid formulations of these products are not recommended for farmer application. However, farmers should be able to safely use granular formulations of these chemicals if they use proper precautions, as indicated on the label. Moderate and low toxicity pesticides are marked with the signal words Warning and Caution, respectively.

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.
Several insecticides listed in this circular are classified RESTRICTED USE by the Environmental Protection Agency. These compounds are marked with a "<R>". Pesticides may be classified as Restricted Use based on their persistence, toxicity or potential environmental hazards. For full information on these, contact your local Cooperative Extension office will have a listing of the dates and locations where certification training can be obtained. Remember that the status of a formulation can change at any time. When purchasing a chemical, be certain to ask the dealer if the attached label is up to date.

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

CONTROL DECISION GUIDELINES/ECONOMIC THRESHOLDS

Economic thresholds are flexible guidelines. They indicate the level of insect abundance that can be tolerated before control actions should be taken. THEY ARE NOT HARD RULES APPLICABLE TO EVERY SITUATION. Used conscientiously, they should be helpful in making treatment decisions. Many variables can affect your decision to treat including insect abundance, relative importance of the crop, relative effectiveness of the pesticide and its application. Timing and accuracy of application, plus the effects of weather, also determine the ultimate degree of control.

CHEMICATION

The term "chemication" refers to the injection and application of chemicals through irrigation systems. Proper equipment needs, procedures for calibration and other instructions for application through center pivot systems are provided in NebGuides G82-413 (Applying Insecticides Through Center Pivot) and G73-43 (Anti-Pollution Devices for Applying Chemicals Through Irrigation Systems, Revised August, 1984), The Nebraska Chemigation Act takes effect January 1, 1987. Consult your local Cooperative Extension Service office or Natural Resources District office before chemication.

INSECT PREVENTION AND CONTROL IN FARM-STORtED GRAIN

Properly managed stored grain should have few insect problems during the first year of storage. However, some grain is to be stored for more than one season. Pests may be present that the grower must have a realistic idea of product expectations and a clear understanding of label statements and product warranties. Insecticides can fail to provide adequate control and there are situations where insecticides formulation used may be necessary, even in these situations. Insecticides are recommended where crop conditions favor insect development and where insect populations will fulfill the economic threshold level within the storage period. Honeybees do not observe nanum boundaries but will collect nectar and/or pollen wherever they can. Including field crops such as corn, sorghum, soybeans and alfalfa, bee colonies are nearby when fields are sprayed during flowering (pollen shed stage for corn and sorghum, and grain development stage for alfalfa). For commercial bee colonies in greater numbers. Insecticide application for the purpose of control, the beekeeper will want to be sure that the field is treated. A band of insecticide around the field is not enough. The entire field should be treated. The product used to control soil insects is wasteful and will lead to higher production costs, protect yourself from product failures. We recommend treating livestock ahead of planting. We recommend treating livestock ahead of planting. PROTECT YOURSELF FROM PRODUCT FAILURES

Many reports of poor rootworm control with soil insecticides were received in 1986, primarily from Northeast Nebraska. Several factors can contribute to such a situation and a few are: 1) unusually high insect population levels, 2) microbial breakdown of the insecticide, 3) high soil pH, 4) inaccurate calibration (resulting in underdosing), 5) poor incorporation, 6) poor placement (too narrow a band) , 7) poor timing application, 8) relatively low toxicity to rootworm larvae, 9) too much rain or soil too dry (weather factors), and 10) other factors.

When one product fails in a field while another product provides control, you must ask some serious questions. The manufacturer in this instance may have a responsibility to the grower. The grower should include a request for replacement of the product, and/or compensation for lost yield.

This responsibility is often settled when the farmer signs a release and accepts payment, sometimes consisting of replacement product, or a cash settlement which may be based on the farmer's yield compared to his 1986, "Pest Management of Farn-Storied Grain," available at your local Cooperative Extension Service office.

POLICY ON TREATMENT OF FIRST YEAR CORN

First year corn is unlikely to benefit from soil insecticide applications. Crop rotation and the recommendation for corn rotation vary with soil conditions. Only the most likely to be first year corn following soybeans or other crops in areas where Northern Corn Rootworm and other pests are a problem. In very small percentages of the fields following soybeans or other crops. NCR larvae may damage first year corn. Lines with greater than 10% county overall population can be sprayed. All corn, soybean and corn/soybean mixtures may be treated. Insecticide is unnecessary, even in these situations. Insecticides are recommended where losses in yield due to insect damage are likely to exceed the cost of insecticide. If the insecticidal formulation you use on each field.

INSECT PESTS IN CONSERVATION TILLAGE SYSTEMS

Modifications of the crop environment in conservation tillage systems could alter the relative importance of Nebraska's more traditional insect pests and possibly create conditions that favor other insect pests. For example, applying the crop to fallow fields or incorporating the crop into the soil may occur. Here's what you need to do to protect yourself:

1. Read the label and understand it. Are there a guarantee? What are the limits of the financial responsibility of the company?
2. Hold the companies to their advertising promises. Use a small amount of a competitor's product to establish a damage threshold and verify the effectiveness of the competitor's product.
3. Keep accurate records of the amount of insecticide formulation you use on each field.
4. Do not agree to settling anything until after the crop is harvested, the yield calculated, and you are satisfied. By settling in midseason, you have no idea of yield loss that may occur.
5. Make observations of damage in the field during the season. Take photographs during vehicle development, including just prior to harvest. Remember to record the verifiable facts, such as insect counts. Examine corn roots for damage no later than mid-July (refer to NebGuide G82-53). The Nebraska Cooperative Extension Service will be happy to help you.

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5. If you need help, contact a professional crop consultant and, if necessary, a good attorney with experience in such cases.

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The text in the image appears to be a list of insecticides and their use instructions. Here is a plain text representation:

### Insecticides and Formulations

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Tomato</th>
<th>Peppers</th>
<th>Sweet Corn</th>
<th>Cucumbers</th>
<th>Broccoli</th>
<th>Apples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambush 2E</td>
<td>3</td>
<td>1</td>
<td>NR</td>
<td>NR</td>
<td>1</td>
<td>***</td>
</tr>
<tr>
<td>Counter 15G</td>
<td>NR</td>
<td>NR</td>
<td>30</td>
<td>NR</td>
<td>NR</td>
<td></td>
</tr>
<tr>
<td>Cygon 40G</td>
<td>0</td>
<td>NR</td>
<td>10</td>
<td>NR</td>
<td>0</td>
<td>28</td>
</tr>
<tr>
<td>Diazinon AG500</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Diazinon 140</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td></td>
</tr>
<tr>
<td>Dip-2-S EC</td>
<td>3</td>
<td>0</td>
<td>20</td>
<td>NR</td>
<td>NR</td>
<td></td>
</tr>
<tr>
<td>Dip-Syston 15G</td>
<td>30</td>
<td>NR</td>
<td>40</td>
<td>NR</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Dyfonate 48G</td>
<td>8</td>
<td>0</td>
<td>15</td>
<td>NR</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Dyfonate 20G</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td></td>
</tr>
<tr>
<td>Furadan 14G</td>
<td>21</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Furadan 15G</td>
<td>21</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Imidan 50WP</td>
<td>14</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Lambda 1.8E</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Lorsban 4E</td>
<td>35</td>
<td>NR</td>
<td>39</td>
<td>NR</td>
<td>30</td>
<td>NR</td>
</tr>
<tr>
<td>Malathion 3G</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Metasystox-R</td>
<td>**</td>
<td>7-21</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td></td>
</tr>
<tr>
<td>Nuclor 1.6L</td>
<td>3</td>
<td>1</td>
<td>1-150</td>
<td>Not stated</td>
<td>1-3</td>
<td></td>
</tr>
<tr>
<td>Parathon 8F (ethyl)</td>
<td>10</td>
<td>15</td>
<td>12</td>
<td>17</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>Parathon 8F</td>
<td>15</td>
<td>NR</td>
<td>7</td>
<td>17</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>Pounce 3.2EC</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>NR</td>
<td>1</td>
<td>**</td>
</tr>
<tr>
<td>Phosphor 2,4,5C</td>
<td>3</td>
<td>NR</td>
<td>3</td>
<td>1</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Sevin 80W</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Thimet 20G</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td></td>
</tr>
</tbody>
</table>

**NB = Not Registered

- At or prior to planting time application only
- Not stated; prespray interval not indicated on label

### Field Re-Entry Periods

Re-entry periods may be listed on the label. Follow label directions and do not enter fields after treatment until the re-entry period has passed.

Aster 150 - 7 days
Ambush 2E - When spray is dry
Cone 6.5S - 48 hrs
Counter 15G - 7 days
Cygon 40G - 48 hrs
Diazinon 140 - When spray is dry
Dip-Syston 24C - 150 - 7 days
Dyfonate 20G - Not stated on label
Ethion EC - 24 hrs
Ethion EC - 72 hrs
Furadan 4F - 14 days
Guthion 50WP - 24 hrs
Imidan 1.8L - Not stated
Lannate 1.8L - When spray is dry
Lorsban 4E - 24 hrs
Malathion 3G - 5 days
Mocap lSG, - Not stated
Phosphor 2,4,5C - Pay-Off
Pydrin 2.4EC - 48 hrs
Sevin 80W - 7 days
Thimet 20G - 7 days

### CONTAINER DISPOSAL

Proper disposal of insecticide containers is very important. Serious accidents have occurred when "empty" containers have not been disposed of safely. Suggested methods of disposal are:

Paper Bags: Be certain that all contents have been emptied into applicators or tanks. Burn paper containers in open fields; 1) regard is given to wind direction in relation to people, domestic animals, and water supplies; 2) where 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. Metal containers in open fields; 1) regard is given to wind direction in relation to people, domestic animals, and water supplies; 2) where burning is not in violation of Federal, State or local ordinances; and 3) provisions are made to avoid contamination of surface water.

### ABBREVIATIONS

- R - Reurban
- WP - Water Soluble Powder
- L - Liquid
- S - Soluble
- EC - Emulsifiable Concentrate
- LP - Low Pour
- GC - Granular
- Form. = Formulation

### CORN ROOTWORM LARVAE

The text discusses the management of corn rootworm larvae, including the effects of soil insecticides, planting date, and scouting methods. It also covers the requirements for proper storage and disposal of used containers.

### Table 1: Amounts in Pounds of Four Soil Insecticide Formulations Needed Per Acre at Various Row Spacings To Obtain Correct Rate Per 1,000 Feet of Row

<table>
<thead>
<tr>
<th>Type of Insecticide Per Acre</th>
<th>10 in.</th>
<th>12 in.</th>
<th>16 in.</th>
<th>18 in.</th>
<th>20 in.</th>
<th>24 in.</th>
<th>30 in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended amount</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pounds of formulated insecticide needed to cover one acre</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formulation</td>
<td>1,000 feet of row</td>
<td>1,000 feet of row</td>
<td>1,000 feet of row</td>
<td>1,000 feet of row</td>
<td>1,000 feet of row</td>
<td>1,000 feet of row</td>
<td>1,000 feet of row</td>
</tr>
<tr>
<td>10% granules</td>
<td>12.24 oz</td>
<td>10.0</td>
<td>10.5</td>
<td>11.3</td>
<td>11.8</td>
<td>12.5</td>
<td>13.3</td>
</tr>
<tr>
<td>14% granules</td>
<td>9.75 oz</td>
<td>7.2</td>
<td>7.5</td>
<td>7.9</td>
<td>8.4</td>
<td>8.9</td>
<td>9.5</td>
</tr>
<tr>
<td>18% granules</td>
<td>8.16 oz</td>
<td>6.7</td>
<td>7.0</td>
<td>7.4</td>
<td>7.8</td>
<td>8.3</td>
<td>8.9</td>
</tr>
<tr>
<td>25% granules</td>
<td>6.12 oz</td>
<td>5.0</td>
<td>5.3</td>
<td>5.6</td>
<td>5.9</td>
<td>6.3</td>
<td>6.7</td>
</tr>
</tbody>
</table>

Damage by corn rootworm larvae is most likely to occur in continuous corn fields. If corn is planted in rows narrower than 12 inches, there are more linear feet of row per acre, which requires more insecticide per acre to obtain the proper rate. By calibrating applicators to deliver the proper rate, growers can treat 1,000 feet of row per gallon, which is an important factor in rootworm control. Soil insecticides are more effective if covered with soil during application. Granules or liquids remaining on the surface after planting may seriously reduce effectiveness, resulting in poor control. Soil insecticides must be applied in bands on both sides of the seed furrow at seed level. Only one application is required to control corn rootworms. Rootworm thresholds are based on the number of beetles per foot of row. Insecticidal thresholds should not be used to enter the seed furrow, or stand reduction may occur. In fields infested with spatially extended populations of corn rootworm beetles, thresholds are generally not as effective. A second application is generally needed if scouting determines that the treated zone is too narrow to adequately protect lateral roots. Regardless of material or placement, some feeding on roots will occur when rootworm numbers are high and egg hatch is extended, so do not expect complete control.
RECOMMENDATIONS FOR REDUCTION OF CORN ROOTWORM LARVAE

A. ROTATING CORN WITH OTHER CROPS IS THE BEST CONTROL RECOMMENDATION.

B. If corn is planted prior to May 15 (this date will vary depending on rootworm egg hatch), apply one of the granular insecticides at cultivation time as early as possible, but usually not later than June 15, and cover with soil or mulch to provide lasting control other than products. A banded treatment of a given product usually provides better rootworm control than an in-furrow treatment of the same material.

C. If planting after May 15, apply one of the granular insecticides in a 7-inch band over plants or basal.*

NOTE: Soil insecticide performance should be evaluated annually by comparing corn root ratings in treated and untreated areas. Use of the same corn rootworm soil insecticide in continuous corn over several consecutive years in the same field has generally been successful in Nebraska. In a few fields with heavy residues, poor effectiveness can be attributed to the continuous use of the same soil insecticide for several years. If problems have occurred with planting-time applications, consider using a cultivation application -- rotating to another crop. When there is no alternative to planting time application in continuous corn, consider the following suggestions:

1. If rootworm control has been poor after use of a carbamate insecticide (Furadan and Bron), switch to an organophosphate (Counter, Dyfonat, Monocap, and Thimet) the following season.

2. If poor performance has resulted after use of an organophosphate insecticide, continue to a carbamate or another organophosphate insecticide.

These two suggestions are offered as precautionary measures. The extent of the problem associated with continuous use of the same insecticide remains unclear. Just how many years it takes a soil to develop a problem or to "recover" is unknown.

For results of annual rootworm insecticide evaluations conducted by entomologists at the University of Nebraska-Lincoln, refer to the Insect Newsletter or contact your local Cooperative Extension Service office.

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

D. Rescue or "Last Resort" Treatment - after June 10 (or earlier depending on timing of egg hatch) emergency treatment at lay-by-time recommended. See 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 plants. If broadcast applications are made by aircraft, use Furadan granules and cultivate into rows immediately. Considerable variation in degree of control has occurred where broadcast applications have not been incorporated into the soil.

RECOMMENDATIONS FOR REDUCTION OF CORN ROOTWORM LARVAE

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Amount Formulation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per 1,000 Row Feet</td>
</tr>
<tr>
<td></td>
<td>Restrictions</td>
</tr>
<tr>
<td></td>
<td>Comments</td>
</tr>
<tr>
<td>carbofuran</td>
<td>8.0 oz</td>
</tr>
<tr>
<td>(Furadan 15G)</td>
<td>Field, sweet and popcorn. Planting, cultivation - over plants or basal.</td>
</tr>
<tr>
<td>chlorpyrifos</td>
<td>8.0 oz</td>
</tr>
<tr>
<td>(Lorasan 15G)</td>
<td>Field, sweet and popcorn. Suggest basal application at cultivation.</td>
</tr>
<tr>
<td>diazinon</td>
<td>2.45 fl. oz</td>
</tr>
<tr>
<td>(Lorasan 15G)</td>
<td>Cultivation. Basal only.</td>
</tr>
<tr>
<td>fonofos</td>
<td>6.0 oz</td>
</tr>
<tr>
<td>(Dyfonat 20G)</td>
<td>Field, sweet and popcorn. Planting, cultivation - over plants or basal. Refer to label for application rates.</td>
</tr>
<tr>
<td>phorate</td>
<td>6.0 oz</td>
</tr>
<tr>
<td>(Thimet 20G)</td>
<td>Field, sweet and popcorn. Planting, cultivation - over plants or basal.</td>
</tr>
</tbody>
</table>

For all rootworm control recommendations, refer to the Insect Newsletter or contact your local Cooperative Extension Service office.

OTHER RECOMMENDED PRODUCTS:

- carbofuran (Furadan 15G)
- chlorpyrifos (Lorasan 15G)
- diazinon (Lorasan 15G)
- fonofos (Dyfonat 20G)
- phorate (Thimet 20G)

For more information, refer to the Insect Newsletter or contact your local Cooperative Extension Service office.

SOIL CUTWORMS

Soil cutworms are most likely to damage corn following nod, pasture, alfalfa, soybeans or small grain stubble. Field blight with heavy, early season weed growth also are more susceptible to cutworm infestations. Treatment is suggested when one or more of the following situations occur:

- Early detection is essential. If the soil surface is dry or crusted, rotary hoeing immediately before or after application may improve control.
- Pyrethroids (Ambush, Pay-Off, Pounce) should not be incorporated. For the most part, cutworms are best controlled by rescue treatments applied after the plants are up and early damage signs are detected. Preventive treatments applied at or prior to planting have generally given erratic control, especially where cutworm numbers have been high.

RECOMMENDATIONS FOR CONTROL OF SOIL CUTWORMS IN CORN

- chlorpyrifos (Lorasan 15G)
- fenvalerate (Pydrin 2.4EC)
- flucythrinate (Py-Off 2.4EC)
- permethrin (Ambush 2.8)

For more information, refer to the Insect Newsletter or contact your local Cooperative Extension Service office.

OTHER RECOMMENDED PRODUCTS:

- carbofuran (Furadan 15G)
- chlorpyrifos (Lorasan 15G)
- diazinon (Lorasan 15G)
- fonofos (Dyfonate 20G)
- permethrin (Ambush 2.8)

For more information, refer to the Insect Newsletter or contact your local Cooperative Extension Service office.

WIREWORMS AND SEED DESTROYING INSECTS

First year corn following small grains, pasture or sod, as well as cover-fallow and early-planted fields are most likely to be damaged by seed-feeding insects. Wireworm beetle larvae and seed-feeding maggots are the first to become noticeable. Wireworms have long life spans and are important pests. Wireworms are considered serious where roots are injured. Wireworm populations are difficult to control. In areas where serious wireworm problems are anticipated, we suggest an in-furrow application of soil insecticide plus a planter box seed treatment.

RECOMMENDATIONS FOR CONTROLLING HEAVY INFESTATIONS OF WIREWORMS, SEEDCORN MAGGOTS, AND SEEDCORN BEETLES IN FIELD CORN

- carbofuran (Furadan 15G)
- chlorpyrifos (Lorasan 15G)
- diazinon (Lorasan 15G)
- fonofos (Dyfonate 20G)
- phorate (Thimet 20G)

For more information, refer to the Insect Newsletter or contact your local Cooperative Extension Service office.

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- carbofuran (Furadan 15G)
- chlorpyrifos (Lorasan 15G)
- diazinon (Lorasan 15G)
- fonofos (Dyfonate 20G)
- phorate (Thimet 20G)

For more information, refer to the Insect Newsletter or contact your local Cooperative Extension Service office.

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First year corn following small grains, pasture or sod, as well as cover-fallow and early-planted fields are most likely to be damaged by seed-feeding insects. Wireworm beetle larvae and seed-feeding maggots are the first to become noticeable. Wireworms have long life spans and are important pests. Wireworm populations are difficult to control. In areas where serious wireworm problems are anticipated, we suggest an in-furrow application of soil insecticide plus a planter box seed treatment.

RECOMMENDATIONS FOR CONTROLLING HEAVY INFESTATIONS OF WIREWORMS, SEEDCORN MAGGOTS, AND SEEDCORN BEETLES IN FIELD CORN

- carbofuran (Furadan 15G)
- chlorpyrifos (Lorasan 15G)
- diazinon (Lorasan 15G)
- fonofos (Dyfonate 20G)
- phorate (Thimet 20G)

For more information, refer to the Insect Newsletter or contact your local Cooperative Extension Service office.
OTHER REGISTERED PRODUCTS:

- chlorpyrifos (Lorsban 15G) 8.0 oz per 1,000 feet of row in furrow for maggots and seedcorn beetle. Use 16.0 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. (Lorsban 4E) 4.0 pints preplant broadcast and incorporated.

- ethoprophos (Mocap 15G) 8.0 oz per 1,000 feet of row as a 7" band over row. For wireworm only. Seed furrow placement will reduce stand. See label for application instructions.

- fonofos (Dynoate 200G) 6.0 oz per 1,000 feet of row. Banded. Seed furrow placement will reduce stand.

- phorate (Thimet 20G) 8.0 oz per 1,000 feet of row. Banded. Seed furrow placement will reduce stand.

- phorate + flucythrinate (Aaster 150G) 8.0 oz per 1,000 feet of row. Do not place granules in direct contact with seed.

WHITE GRUBS (GRUBWORMS) (RP 98)

There is no effective way to control white grubs after fields have been planted. Soil insecticides 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 Restrictions and Comments

- chlorpyrifos 8.0-16.0 oz In furrow or T-Band. (Lorsban 15G) form/1,000 ft of row
- 13.5 lb/A Preplant broadcast incorporated.

- chlorpyrifos (Lorsban 48G) 8.0 oz form./ 1,000 ft of row
- 6.0 oz form./ 7" band over row in front or behind press wheel. (Pyran 20G)
- phorate + flucythrinate (Aaster 150G) 8.0 oz form./ 1,000 ft of row
- Place granules in 6-8 inch band over the row directly behind or in front of press wheel. (Aaster 200G)
- terbufos 8.0-16.0 oz form./ 1,000 ft of row
- Apply in a 7 inch band at either rate, or in furrow at planting time at lower rate only. (Counter 150G)

CORN INSECTS ABOVE GROUND

SPRAYING POLLEN-SHEDDING CORN CAN BE EXTREMELY HAZARDOUS TO BEES. COORDINATE WITH LOCAL BEEKEEPERS BEFORE APPLYING INSECTICIDES.

CORN ROOTWORM ADULTS TO PREVENT SILK CLIPPING

Corn rootworm beetles occasionally interfere with pollination if there are sufficient numbers to chew silks to husks during the pollen-shedding period. Controls are indicated only in severe silk clipping is occurring at 25-50 percent pollen shed. In an average year, few fields will need to be sprayed to prevent silk clipping. Beetles are most likely to cause a problem in late-planted or late-silking fields. Silk clipping after pollination causes no problems.

CORN ROOTWORM ADULTS TO REDUCE LARVAE THE NEXT YEAR

- phorate (Thimet 20G) 6.0 oz form./ 1,000 ft of row
-Apply as directed spray at base of plants. (Counter 20G) 2.0 oz form./ 1,000 ft of row

RECOMMENDATIONS FOR CONTROL OF CHINCH BUGS IN CORN

Insecticide Rate Restrictions and Comments

- carbaryl (Sevin 80S, XLR Plus, Sevin 4 OIl) 2.0 lb AI/A Apply as directed spray with at least 40 gallons of water per acre.
- carbaryl (Sevin 80S, XLR Plus, Sevin 4 OIl) 0.5 lb AI/A Apply as directed spray with at least 20 gallons of water per acre.
- carbaryl (Sevin 80S, XLR Plus, Sevin 4 OIl) 0.1-0.2 lb AI/A Apply as directed spray at base of plants. Wait 21 days before harvest.
- fenvalerate (Pydrin 2.4EC) 0.5 lb AI/A Aerial application only. Do not apply within 12 days of harvest. Apply only when chinch bugs are exposed.
- phorate (Thimet 20G) 6.0 oz form./ 1,000 ft of row
- Apply granules at time of cultivation in a band over or at base of plants just ahead of cultivator shovels so granules are covered with soil as for corn rootworm control. One post-emergence application per season. Do not use for fall forage within 30 days of treatment.

Insecticide Rate Restrictions and Comments

- carbaryl (Sevin 80S, XLR Plus, Sevin 4 OIl) 2.0 lb AI/A Apply as directed spray with at least 40 gallons of water per acre.
- carbaryl (Sevin 80S, XLR Plus, Sevin 4 OIl) 0.5 lb AI/A Apply as directed spray with at least 20 gallons of water per acre.
- carbaryl (Sevin 80S, XLR Plus, Sevin 4 OIl) 0.1-0.2 lb AI/A Apply as directed spray at base of plants. Wait 21 days before harvest.
- fenvalerate (Pydrin 2.4EC) 0.5 lb AI/A Aerial application only. Do not apply within 12 days of harvest. Apply only when chinch bugs are exposed.
- phorate (Thimet 20G) 6.0 oz form./ 1,000 ft of row
- Apply granules at time of cultivation in a band over or at base of plants just ahead of cultivator shovels so granules are covered with soil as for corn rootworm control. One post-emergence application per season. Do not use for fall forage within 30 days of treatment.

PREVENTING CHINCH BUG DAMAGE BY CULTURAL PRACTICES is more reliable than chemical controls. If chinch bugs were a problem the previous year, do not plant corn into wheat stubble or adjacent to wheat fields. If chemical controls are necessary, apply a recommended soil insecticide as Sevin XLR Plus. Residual activity is reduced by overhead irrigation or rainfall after application. If beetles reinfest the field, make a second application when population levels 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 the following spring. IN CONTINUOUS CORN, IF YOU DO NOT HAVE SCOUTING DATA FROM THE PREVIOUS SEASON FOR THE FULL BEETLE ACTIVITY PERIOD, CONSIDER A SOIL INSECTICIDE APPLICATION AT CULTIVATION OR PLANTING AS A PRECAUTIONARY MEASURE. IT SHOULD BE NOTED THAT MANY FIELDS NEVER DEVELOP A ROOTWORM PROBLEM.

CHINCH BUGS (Neodesa GB6-606, RP 98)

There are many different species of chinch bugs, and they can be very difficult to control. Some species are more common than others, and their habits and preferences vary. In general, chinch bugs are most active in the spring and summer months, and they tend to be more abundant in areas with warm, dry conditions. The best way to control chinch bugs is to prevent them from entering a field. This can be done by removing any plants that may be hosts for chinch bugs, by using insecticides that are specifically designed to control chinch bugs, or by using cultural practices such as crop rotation. In some cases, it may be necessary to use a combination of these methods to effectively control chinch bugs.
The decision to treat for European corn borer (ECB) 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, some of these variables help growers make intelligent assessments as to the need for control of each of our two annual generations.

**FIRST GENERATION**

ECB moths prefer the tallest plants for egg laying. Therefore, expect initial concentrations of egg-laying moths in earliest planted fields and/or those fields where the corn plants are taller than corn in surrounding fields. If most fields are about the same height, some varieties of corn are more susceptible than others. Ask your seedman about locally adapted varieties that produce well and carry some resistance to the borer.

Some ECB larval feeding in corn plants are taller than corn in surrounding fields. If most fields are about the same height, 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.

To determine the need to treat for first generation borer, examine AT LEAST 25 corn whorls in each field.

**Estimate the population of ECB in each field.** Ideally, you should make this final population estimate at the end of the first generation by making a decision on first generation ECB treatment, the following information is needed:

1. **Average percent infested whorls in the field and average number of worms per infested plant.** These numbers help provide an estimate of possible maximum number of cavities per plant at the end of the first generation.

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:** An average of one borer cavity per plant is capable of causing an approximate 3% yield loss. In the example shown, from scouting you know that 50% of the plant whorls are infested and the average damage of 4 leaves per whorl is expected. Therefore, 50 x 4 = 2.0 worms per plant, if all worms survive. Assume 75% control and $1.75 per bu. with a yield expectation of 125 bu. per acre.

**Example Field**

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Rate (Form/Acre)</th>
<th>Restrictions and Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacillus thuringiensis</td>
<td>10 lb</td>
<td>No restrictions. Field, sweet, pop seed corn.</td>
</tr>
<tr>
<td>(Delphos 32EC)</td>
<td>1.5-2.0 pt</td>
<td>No restrictions. May be applied through overhead sprinkler irrigation system.</td>
</tr>
<tr>
<td>(Dipel ES)</td>
<td>1.5-2.0 pt</td>
<td>No restrictions. May be applied through overhead sprinkler irrigation system.</td>
</tr>
<tr>
<td>(Counter 15G)</td>
<td>2.5-5.0 pt</td>
<td>No restrictions. May be applied through overhead sprinkler irrigation system.</td>
</tr>
<tr>
<td>(Lorsban 4E)</td>
<td>1.5-2.0 pt</td>
<td>Lorsban 4E insecticide may be applied through an overhead sprinkler irrigation system. Field, sweet and popcorn.</td>
</tr>
<tr>
<td>(Pounce 3.2EC)</td>
<td>4-8 oz</td>
<td>Pounce 3.2EC insecticide may be applied through an overhead sprinkler irrigation system. Field and popcorn.</td>
</tr>
<tr>
<td>(Pounce 1.5G)</td>
<td>6.7-13.3 lb</td>
<td>Field corn and popcorn only.</td>
</tr>
<tr>
<td>(Pounce 1.5G)</td>
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</tr>
<tr>
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</tr>
<tr>
<td>(Counter 15G)</td>
<td>10 lb</td>
<td>Field corn and popcorn only.</td>
</tr>
</tbody>
</table>

**CAUTION:** Bories which have left the whorl and entered the stalk cannot be controlled. If most have left the whorl, it is too late to attempt control. Be certain to sample enough plants (25 plants in 4 locations in each field IS A MINIMUM SAMPLE) at least locations in each field to ensure that estimates are typical of the field.

1. **Potential yield loss** (2 larvae/plant x 5% x 10% loss in yield, 10% x 125 Bu = 12.5 Bu loss/A).*

2. **Dollar loss/A** (12.5 Bu x $1.75 = $21.87/ A) **(Pounce 3.2EC)**

3. **Preventable loss** (if chemical is 75% effective) $21.87 x 75% = 16.13/ A) **(Pounce 3.2EC)**

4. **Chemical cost ($4.00/A) and application cost ($4.00/A).** Estimate your own cost or call dealer/applicator. **TOTAL = $21.87/A.**

5. **Compare preventable loss ($16.13/A) with treatment cost ($12.50 x $1.5 $21.00 = $4.41/A).** (dollars saved by treatment).

6. **Compare preventable loss ($16.13/A) with treatment cost ($12.50 x $1.5 $21.00 = $4.41/A).** (dollars saved by treatment).

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Rate (Form/Acre)</th>
<th>Restrictions and Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Carbofuran)</td>
<td>6.5 lb</td>
<td>Do not make a foliar application if Furadan 15G was applied at more than 8 ounces per 1,000 linear feet of row at planting (6.7 lbs/acre with 60 inch row spacing) at planting. No more than two foliar applications per season. Field corn only.</td>
</tr>
<tr>
<td>(Pydrin 2.4EC)</td>
<td>6.5 lb</td>
<td>No more than 16 oz/1,000 ft row or 13 lb/A (two applications per season). Field, sweet and popcorn.</td>
</tr>
<tr>
<td>(Furadan 15G)</td>
<td>5.0 lb</td>
<td>Field, sweet and popcorn.</td>
</tr>
<tr>
<td>(Furadan 4F)</td>
<td>2.5 lb</td>
<td>Pennco-P insecticide may be applied through an overhead sprinkler irrigation system. Field corn only.</td>
</tr>
<tr>
<td>(Furadan 15G)</td>
<td>2.5 lb</td>
<td>Pennco-P insecticide may be applied through an overhead sprinkler irrigation system. Field corn only.</td>
</tr>
<tr>
<td>(Pounce 3.2EC)</td>
<td>4-8 oz</td>
<td>Pounce 3.2EC insecticide may be applied through an overhead sprinkler irrigation system. Field and popcorn.</td>
</tr>
<tr>
<td>(Pounce 1.5G)</td>
<td>6.7-13.3 lb</td>
<td>Field corn and popcorn only.</td>
</tr>
<tr>
<td>(Pounce 1.5G)</td>
<td>6.7-13.3 lb</td>
<td>Field corn and popcorn only.</td>
</tr>
<tr>
<td>(Pounce 1.5G)</td>
<td>6.7-13.3 lb</td>
<td>Field corn and popcorn only.</td>
</tr>
<tr>
<td>(Counter 15G)</td>
<td>10 lb</td>
<td>Field corn and popcorn only.</td>
</tr>
</tbody>
</table>

**RECOMMENDATIONS FOR CONTROL OF FIRST GENERATION EUROPEAN CORN BORER**

- **Supplemental label subject to change.**
- **Other Registered Products:**
  - carbaryl (Sevin XLR Plus, 80G)
  - carbofuran (Furadan 4F)
  - chlorpyrifos (Lorsban 4F, Pounce 3.2EC)
  - diazinon 14G
  - fenvalerate (Pydrin 2.4EC)
  - permethrin (Counter 15G)
  - phorate (Thimet 200D)

**OTHER REGISTERED PRODUCTS:**

- Rates of material are active ingredients per acre.
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 when the second flight of moths appears, usually in mid-July, examining the undersides of leaves for white borers 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 application is critical if reasonable control is to be achieved. Research indicates that favorable economic return will usually be achieved when 30-50% of the plants are infested with egg masses that are just beginning to hatch, and before corn has reached the blister stage. A 70-80% infestation control (approximately 30-70%, depending on timing, application and product choice) is realized when application is timed at first egg hatch and young larvae are still located in the leaf axil. Larvae which have bored behind the leaf axil, into the sheath or are in or on the ear are not likely to be controlled. The best control that can be achieved will usually prevent much of the stalk and leaf sheath tunneling, but will not necessarily prevent invasion of the ear tip. This is especially true if the borer flight period is extended or a partial third generation occurs.

Stalk protection is critical for the plant to fully develop the ear. While late worms that attack the ear tip do reduce grain quality, they do not reduce yields as seriously as borers that tunnel in stalks. Early harvest and selection of a corn variety that has good ear retention qualities should minimize ear drop.

As the plant approaches blister stage and beyond, potential economic benefits of an insecticide application rapidly decline. Scout fields (depending on timing, application and product choice) are realized when application is timed at first egg hatch and young larvae are still located in the leaf axil. Research indicates that favorable economic return will usually be achieved when 30-50% of the plants are infested with egg masses that are just beginning to hatch, and before corn has reached the blister stage. A 70-80% infestation control (approximately 30-70%, depending on timing, application and product choice) is realized when application is timed at first egg hatch and young larvae are still located in the leaf axil. Larvae which have bored behind the leaf axil, into the sheath or are in or on the ear are not likely to be controlled. The best control that can be achieved will usually prevent much of the stalk and leaf sheath tunneling, but will not necessarily prevent invasion of the ear tip. This is especially true if the borer flight period is extended or a partial third generation occurs.

Stalk protection is critical for the plant to fully develop the ear. While late worms that attack the ear tip do reduce grain quality, they do not reduce yields as seriously as borers that tunnel in stalks. Early harvest and selection of a corn variety that has good ear retention qualities should minimize ear drop.

RECOMMENDATIONS FOR CONTROL OF SECOND GENERATION EUROPEAN CORN BORER

**Insecticide** | **Rate** | **Restrictions and Comments**
--- | --- | ---
Dipel 100 | 10.0 lb | No restrictions.
Dipel 80 | 1.5-2.0 pt | No restrictions.
Carbaryl 4F (Furadan 15G) | 6.7 lb | Do not make a foliar application if Furadan 15G was applied at more than 8 ounces per 1,000 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.
Carbaryl 4E (Furadan 4F) | 1.5-2.0 pt | Do not make a foliar application if more than 6.7 lbs of Furadan 15G or 4F were used per 13,000 linear feet (one acre with 40 inch row) at planting. Two more than two foliar applications per season. Do not apply within 30 days of harvest. Do not apply on corn seed prior to tasseling or pollination. Do not reenter treated areas within 14 days of application. Field corn only.
Chlorpyrifos (Lorsban 4E) | 1.0 qt | In addition to aerial or ground application, Lors­ ban 4E may be applied through an overhead sprinkler irrigation system.* Do not apply within 30 days before harvest of grain. Do not allow live­ stock to graze in treated areas, or harvest treated corn silage for feed for meat or dairy animals within 14 days after last treatment. Do not feed treated corn fodder to meat or dairy animals within 14 days after last treatment. Field, sweet and popcorn.
Oxamyl 140 | 7.0 lb | No more than 16 cu/0.1,000 ft3 row or 33 lbs/A (two applications per season. Do not apply within 13 days after harvest of grain. Do not allow live­ stock to graze in treated areas, or harvest treated corn silage for 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 | 8.0-10.6 oz | Do not feed treated fodder to dairy or beef cattle or sheep for 10 days following application. Corn may be harvested and fed for livestock within 14 days after last treatment. Do not feed treated corn fodder to meat or dairy animals within 14 days after last treatment. Field, sweet and popcorn.
Tetclofos | 5.0 lb | Do not feed treated fodder to dairy or beef cattle or sheep for 10 days following application. Corn may be harvested and fed for livestock 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.
Methoxybendthiazole (Pounce 3.2EC) | 2.0 qt | Do not apply within 30 days of harvest or feed or graze livestock within 30 days of treatment. Field and sweet corn.
Methyl parathion (Pounce 1.5G) | No restrictions. | In addition to conventional application, can be applied through an overhead sprinkler irrigation system.* Read label relative to bee hazards prior to application.
Permethrin (Pounce 3.2EC) | 4-8 oz | May be applied through overhead sprinkler irriga­ tion system.* Apply prior to ear formation which develops after the completion of pollination (blister stage) and is indicated by the initiation of brown silk. Field corn and popcorn only.
Permethrin (Pounce 1.5G) | 6.7-13.3 lb | Field corn and popcorn only.
Permethrin (Ambush 2E) | 6.4-12.8 oz | Apply prior to ear formation which develops after the completion of pollination (blister stage) and is indicated by the initiation of brown silk. Field corn and popcorn only.
Ambush 2E | 0.4-0.8 lb | Same restrictions as Ambush 2E.
Tebufo* | 6.7 lb | Limited to 2 applications, or a single application of 6.7 lbs or more of rows were used at planting. Do not enter field until 7 days post­ treatment. Do not graze for grain, cut for forage or use in hay or silage production within 45 days of application. Field, and sweet corn.
Tebufo* (Counter 15G) | No restrictions as Ambush 2E.
**No more than 16 lbs per 1,000 ft3 row or 33 lbs/A (two applications per season. Do not apply within 13 days after harvest of grain. Do not allow live­ stock to graze in treated areas, or harvest treated corn silage for 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.

*This method of application dictates the use of specific equipment, specific application conditions, accurate calibration, and critical safety precautions (see page 2). Consult the label for complete directions prior to use.

**Supplemental label subject to change.

OTHER REGISTERED PRODUCTS:
- Carbaryl (Sivin XLR Plus, 80SG). See label.
- Ethyl parathion. Both generations, label states just corn. See label.
- Ethyl parathion - EPN. See label.
- Methoxybendthiazole (Lannate L and Lannate SP). Both generations, sweet corn only. See label.

GRASSHOPPERS IN CORN (NebGuide G86-791)

Grasshopper control is best accomplished when hoppers are small and confined to grassy or weedy margins. Around fields, the following table can be used as a guide to evaluate the need for treatment for cropland grasshoppers. It is based on the estimated number of young grasshoppers (brown Silk). Field, and sweet corn.

<table>
<thead>
<tr>
<th>Insecticide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate</td>
</tr>
<tr>
<td>Restrictions and Comments</td>
</tr>
<tr>
<td>Chlorpyrifos (Lorsban 15G)</td>
</tr>
<tr>
<td>6.5 lb</td>
</tr>
</tbody>
</table>
| No more than 16 cu/0.1,000 ft3 row or 33 lbs/A (two applications per season. Do not apply within 13 days after harvest of grain. Do not allow live­ stock to graze in treated areas, or harvest treated corn silage for 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.

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

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Many products are used to control western bean cutworms have been shown to increase the risk of spider mite infestations. If spider mites are present, even in very small numbers, select an insecticide that is least likely to stimulate increases in mite reproduction (see spider mite section).

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

<table>
<thead>
<tr>
<th>Classification</th>
<th>Field</th>
<th>Field Margin</th>
<th>Treatment Necessary?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-economic</td>
<td>0 to 2</td>
<td>5 to 10</td>
<td>Usually not</td>
</tr>
<tr>
<td>Light</td>
<td>3 to 7</td>
<td>11 to 20</td>
<td>Questionable (depends on hopper size, species &amp; crop)</td>
</tr>
<tr>
<td>Moderate</td>
<td>8 to 14</td>
<td>21 to 40</td>
<td>Probably</td>
</tr>
<tr>
<td>Abundant</td>
<td>15 or more</td>
<td>41 or more</td>
<td>Yes</td>
</tr>
</tbody>
</table>

SPRAYING POLLINATING CORN CAN BE EXTREMELY HAZARDOUS TO BEES, COORDINATE WITH LOCAL BEEKEEPERS BEFORE APPLYING INSECTICIDES.

REGISTRATION FOR CONTROL OF GRASSHOPPERS IN NON-CROP AND WASTE AREAS ARE ACTIVE INGREDIENT PER ACRE.

- acephate (Orthene 75G) | 0.125-0.5 lb
- carbofuran (Furadan 4F) | 0.25 lb
- chlorpyrifos (Lorsban 4E) | 0.25-0.5 lb
- diazinon (AOS 60) | 0.5 lb
- fenvanil (Phygon 2.4EC) | 0.05-0.1 lb
- methyl parathion (Pencap-M) | 0.1 lb
- methamidophos + BPM | 0.5 lb
- permethrin (Ambush 2E, 2.5W, Pounce 3.2EC) | 0.25 lb

Other Registered Products:

- malathion 57EC | 0.05-0.1 lb
- carbaryl | 0.15 lb
- carbaryl | 0.15 lb
- diazinon AOS 60 | 0.5 lb
- malathion ULV 9.33 | 4 lb
- fenvanil (Phygon 2.4EC) | 0.05-0.1 lb
- methyl parathion (Pencap-M) | 0.1 lb
- methamidophos + BPM | 0.5 lb
- permethrin (Ambush 2E, 2.5W, Pounce 3.2EC) | 0.25 lb

If grasshoppers have already invaded the corn field, refer to the table above to determine if control is needed.

RECOMMENDATIONS FOR CONTROL OF GRASSHOPPERS IN CORN

Rates are active ingredient per acre.

- carbofuran (Furadan 4F) | 0.25 lb
- chlorpyrifos (Lorsban 4E) | 0.25-0.5 lb
- diazinon AOS 60 | 0.5 lb
- fenvanil (Phygon 2.4EC) | 0.05-0.1 lb
- malathion ULV 9.33 | 4 lb

If grasshoppers have already invaded the corn field, refer to the table above to determine if control is needed.

RECOMMENDATIONS FOR CONTROL OF FLEA BEETLES

Rates are active ingredient per acre.

- carbofuran (Furadan 4F) | 0.25 lb
- chlorpyrifos (Lorsban 4E) | 0.25-0.5 lb
- diazinon AOS 60 | 0.5 lb
- fenvanil (Phygon 2.4EC) | 0.05-0.1 lb
- methyl parathion (Pencap-M) | 0.1 lb
- methamidophos + BPM | 0.5 lb
- permethrin (Ambush 2E, 2.5W, Pounce 3.2EC) | 0.25 lb

OTHER REGISTRED PRODUCTS:

- malathion 57EC | 0.05-0.1 lb
- carbaryl | 0.15 lb
- carbaryl | 0.15 lb
- diazinon AOS 60 | 0.5 lb
- malathion ULV 9.33 | 4 lb
- fenvanil (Phygon 2.4EC) | 0.05-0.1 lb
- methyl parathion (Pencap-M) | 0.1 lb
- methamidophos + BPM | 0.5 lb
- permethrin (Ambush 2E, 2.5W, Pounce 3.2EC) | 0.25 lb

RECOMMENDATIONS FOR REDUCTION OF SPIDER MITES

For BGM only: Treatment is usually justified if 1 lower leaf is yellowing from mite damage and colonies are present on the 2-3 ear zone. In Nebraska, dieback (Gyno 490) or debt is generally provided reasonable BGM control.

For TEM only or TEM plus BGM: No miticide/insecticide or combinations have provided consistent, effective control of TEM, and chemical treatments may actually aggravate TEM problems. However, treatment may be justified when moderate to heavy infestations of TEM are present. Overlapping applications of TEM with active TEM colonies and moderate damage is apparent. Treat only the heavily infested areas of the field to allow for reductions in damage. These products cause little mortality to either species, whether insecticides/miticides are toxic to TEM. Special products differ in their effects on the two species. It is important to determine which products are present in the field before making an application. Products that have sometimes been associated with both TEM and TEM problems following their use include permethrin (Pounce, Ambush) and to a lesser extent, fenvalerate (Phygon, which, under some circumstances may even reduce TEM and carbaryl (Sevin). Other products, including parathion, are likely to be associated with mite flares only when TEM is present. Still other chemicals have not been reported to cause TEM problems. The use of these products is strongly discouraged except in extreme situations. Many products are used to control western bean cutworms have been shown to increase the risk of spider mite infestations. If spider mites are present, even in very small numbers, select an insecticide that is least likely to stimulate increases in mite reproduction (see spider mite section).
ARMYWORMS
(NebGuides 82-613, 82-615, RP 98)

Control when migration from adjacent grassy areas, pastures or fields is sufficient to
damage margin rows of corn, or when infestations are causing the loss of two 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 when applied in evening or early morning.

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

<table>
<thead>
<tr>
<th>Product</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>carbofuran (Furadan 4F)</td>
<td>1.0 lb</td>
</tr>
<tr>
<td>dimethoate (Cygon 400)</td>
<td>0.5 lb</td>
</tr>
<tr>
<td>disulfoton (Di-Syston 15G)</td>
<td>1.0 lb</td>
</tr>
<tr>
<td>ethion (Wiston 100)</td>
<td>0.1 lb</td>
</tr>
<tr>
<td>oxadiazysthymethyl (Metasystox-R 2EC)</td>
<td>0.5 lb</td>
</tr>
<tr>
<td>phorate (Thimet 20G)</td>
<td>1.0 lb</td>
</tr>
<tr>
<td>terbufos (Counter 150)</td>
<td>1.0 lb</td>
</tr>
</tbody>
</table>

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

MAGGOT AND CUTWORMS
(Sorghum Guides 16, 20)

Cutworms feed on above ground portions of plants while older cutworms cut plants at or below
the soil surface.

Insecticides, arsenicals, and carbamates may be used for cutting and feeding damage. These
insecticides, however, are not recommended for late summer feeding damage. Applications
should provide adequate coverage of the crop, particularly on plants in or near the row edge.

MAGGOT AND CUTWORMS
(Sorghum Guides 16, 20)

Forage sorghums, typically planted in early July following harvest of small grains,
should be treated with an approved soil systemic at planting, since they run greater risk of
serious GB infestation in the seedling stage. For infestations on late planted plants, treatment
may be justified when 258 of the lower leaves have GB colonies and are showing signs of
feeding damage.

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

<table>
<thead>
<tr>
<th>Product</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>chlorpyrifos (Lorasan 4E)</td>
<td>0.25-0.5 lb</td>
</tr>
<tr>
<td>dimethoate (Cygon 400)</td>
<td>0.5 lb</td>
</tr>
<tr>
<td>disulfoton (Di-Syston 15G)</td>
<td>1.0 lb</td>
</tr>
<tr>
<td>fonofos (Dyfonate 4EC)</td>
<td>0.5 lb</td>
</tr>
<tr>
<td>parathion (ethyl on only}</td>
<td>0.5 lb</td>
</tr>
</tbody>
</table>

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

Revised guidelines are based more on damage than on greenbug numbers, therefore, they apply to
both resistant and susceptible grain sorghum varieties. Most recommendations are based on
rules. Resistant lines should tolerate greenbug damage better than susceptible lines. Old plant lines will tolerate more greenbugs, while small or stressed plants will generally
tolerate less.

Soil cutworms are occasional pests of seedling sorghum. The most common species
involved is the black cutworm. This pest is a greenish gray or white with a brown head.
The cutworm may be over one inch long when feeding is completed. Black cutworms feast
primarily at night and will hide under debris or in the soil during the day. Young black
cutworms feed on above ground portions of plants while older cutworms cut plants at or below
the soil surface.

RECOMMENDATIONS FOR SOIL CUTWORM CONTROL IN SORGHUM

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Rate</th>
<th>Restrictions and Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>chlorpyrifos (Lorasan 4E)</td>
<td>0.5-1.0 lb A/A</td>
<td>Apply with sufficient water for thorough coverage. Do not apply more than 3 pts of Lorasan 4E per acre per season. The treated crop must be used for forage, fodder, hay, or silage within 30 days after application of one pint per acre or within 60 days after application of more than one pint per acre. Do not treat sweet varieties of sorghum.</td>
</tr>
</tbody>
</table>
PREVENTING CHINCH BUG DAMAGE TO SORGHUM BY CULTURAL PRACTICES

CHINCH BUGS (Neobus G86-806, RF 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 sorghums. Effective and may need to be supplemented with foliar sprays. Also, these sprays may need to be repeated during the period of migration.

Research in Nebraska and Kansas indicates that Furadan 15G applied in the seed furrow at time of planting provides the longest lasting control of chinch bugs moving into sorghums. This treatment gives 3 to 4 weeks protection. Place in furrow with seed. Should give 3 to 4 weeks protection.

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

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Rate</th>
<th>Restrictions and Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>carbofuran</td>
<td>8.0 oz per 1,000 ft. of row</td>
<td>Place in furrow with seed. Should give 3 to 4 weeks protection.</td>
</tr>
<tr>
<td>carbaryl (Contin 80S, Sevino 4)</td>
<td>2.0 lb/A</td>
<td>Apply as directed spray with at least 40 gallons of water per acre.</td>
</tr>
<tr>
<td>chlorpyrifos (Lorsban 4E)</td>
<td>0.5-1.0 lb/A</td>
<td>Apply as directed spray with sufficient water for thorough coverage, using ground equipment only. Do not apply more than 3 pts of Lorsban 4E per acre per season. The treated crop is not to be used for forage, fodder, hay, or silage within 30 days after treatment of 1 pt or 60 days after treatment of more than 1 pt. Do not treat sweet varieties of sorghum.</td>
</tr>
<tr>
<td>ethyl parathion (Thimet 20G)</td>
<td>0.75 lb/A</td>
<td>Aerial application only. Do not apply within 12 days of harvest. Apply only when chinch bugs are exposed.</td>
</tr>
<tr>
<td>phorate (Lorsban 4E)</td>
<td>6.0 oz form./1,000 ft. of row</td>
<td>Apply over or at base of plants at cultivation and cover with soil. One application per season. Do not feed foliage before grain harvest.</td>
</tr>
</tbody>
</table>

POST-EMERGENCE

Registered for "early season" control. With excess rainfall or irrigation, low pH (6 or lower), low temperature (less than 50°F) and low organic levels (under 1%), chemical breakdown is reduced and may cause residues to move deeper into the soil and possibly contaminate groundwater. Registered for "early season" control but not recommended.

Furadan 15G is registered for "early season" control. With excess rainfall or irrigation, low pH (6 or lower), low temperature (less than 50°F) and low organic levels (under 1%), chemical breakdown is reduced and may cause residues to move deeper into the soil and possibly contaminate groundwater. Registered for "early season" control but not recommended.

1987 PLANT DISEASE, WEED AND INSECT INFORMATION

Plant Pathology, Weed Science, and Insect newsletters have been combined into one mailing package by the Nebraska Cooperative Extension Service.

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• Recommendations from Extension Weeds Specialists.
• Recommendations from Extension Entomologists.
• Recommendations from Extension Plant Pathologists.
• Information on regulations, chemicals and other pest control procedures.

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Address
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Please mail to: Department of Agricultural Communications
108 Agricultural Communications
University of Nebraska-Lincoln
Lincoln, NE 68583-0918

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The Cooperative Extension Service provides information and educational programs to all people without regard to race, color, national origin, sex or handicap.
PLANT DISEASE, WEED AND INSECT INFORMATION

We refer growers to the series of "Plant Disease, Weeds and Insects" issued by the Department of Agriculture Extension Service of the University of Nebraska. These bulletins contain news and information of importance to farmers and gardeners. The new edition of the bulletin is issued each April.

The U.S. Department of Agriculture has adopted a more restrictive attitude toward the importation of grain and seed from outside the United States. The law requires that all grains and seeds imported into the United States must be free of insect pests. The Department of Agriculture, therefore, strongly recommends that all grain and seed growers take precautions to protect their crops from insect pests. The bulletin contains information on the latest methods of controlling insects and diseases.

The bulletin is available at a cost of $1.00 per copy. A limited number of copies are available at a 50% discount for orders of 100 copies or more. The bulletin is available in a hardcover edition for $5.00 per copy. The hardcover edition is available at a 50% discount for orders of 100 copies or more.

Name of Grower

Address

City

State

Zip

Phone:

Mail this coupon to:

Department of Agricultural Communications

108 Agricultural Communications

University of Nebraska-Lincoln

Lincoln, NE 68588-0916

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