VEGETARIAN

March 15, 1954

MR. COUNTY AGENT:

Numerous changes in recommendations have been presented since the last revision of the Handbook on Pesticides, February, 1951. We've made every effort to keep you up-to-date on major developments, including newsletters, crop production guides and meetings.

Now, you say it's time to pull some of the loose ends together? O.K....here's our latest on Vegetable Insect Control, prepared in cooperation with Station entomologists and including interpretations of research up to January 1, 1954. Revisions will be made when we can improve on the presentation or when warranted by further research with these or additional pesticides.

This presentation is not intended to give every detail, but to make available pertinent facts for your use. For example, we have not included comments on such items as when to discontinue applications and other precautionary statements. This in no way is intended to minimize these considerations. As a county agent you know each chemical offers a definite problem, and every effort must be made to insure protection of the user and consuming public. Strict adherence to precautionary statements such as those on reputable manufacturer's required pesticide labels, until further research and/or legislation indicates otherwise, should be constantly emphasized to pesticide users.

Spray materials are shown in amounts (or equivalent) per 100 gallons water. Amounts of sprays and dusts to use per acre vary widely with plant size and spacing. In general, around 20-35 pounds of dust or 75 to 150 gallons of spray are adequate. Thorough coverage is the essential feature.

The accompanying chart is prepared for your convenience while in the field and we hope you find it useful as a ready reference.

**BUSH and POLE BEAN**

<table>
<thead>
<tr>
<th>Armyworm</th>
<th>Spray:</th>
<th>Dust:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>DDT wp, 2 lbs. 50%</td>
<td>DDT 5%</td>
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<tr>
<td></td>
<td>Chlordane wp, 2 lbs. 40%</td>
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<tr>
<td></td>
<td>Toxaphene wp, 2 1/2 lbs. 40%</td>
<td>Toxaphene 10%</td>
</tr>
</tbody>
</table>

Apply when armyworms appear, continue at 7-day intervals until control is complete. Armyworms often migrate into field, or moths lay eggs and young develop on grass. When grass is destroyed worms migrate to beans. Sulfur may be used as all, or a part, of the diluent in dusts for beans. See sulfur burn comments under disease control.

Toxaphene is not recommended for pole beans in the West Coast area as it may cause severe burn. DDT and TDE (DDD) are not suggested in the Sanford area.

<table>
<thead>
<tr>
<th>Bean leaf-hopper and Leaf-roller</th>
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Apply at first signs of leaf-hoppers, 1 to 3 applications at 10-day intervals, last treatment just before blooming. See remarks above relative to using sulfur as a diluent.

In Everglades and Lower West Coast areas leaf-hoppers most severe in spring.
during warm dry periods; in Central and Northern Florida most prevalent in the fall. Young plants suffer most.

One treatment should be sufficient for leaf-rollers. Wait for fairly heavy population before applying insecticide. Dust borders of large field with airplane. Usually not necessary to treat whole field unless small or infestation severe.

**Spray:**
- Cucumber beetle: Chlordane wp, 2½ lbs. 40%  
- 12-spotted and banded: DDT wp, 2 lbs. 50%

**Dust:**
- Chlordane 5%
- DDT 5%

Apply when insects or damage is evident. Regular applications of DDT for control of other pests will reduce damage from cucumber beetles.

DDT has given best control in the Homestead area.

**Spray:**
- Cutworm: toxaphene wp, 2½ lbs. 40%  
- Chlordane wp, 2½ lbs. 40%

**Dust:**
- toxaphene 10%  
- Chlordane 5%  
- Chlordane 1½-2%

Apply before planting if worms are present or at first signs of worm damage to young plants. Check field carefully for worms before seeding, if worms are found use bait. Watch young plants for injury and bait or dust immediately.

A home-made bait can be prepared by thoroughly mixing 3 or 4 pounds of wettable chlordane or toxaphene with 100 pounds of wheat bran. Moist the bait slightly just prior to applying. Best to apply bait in late afternoon.

Note comments on toxaphene on pole beans in West Coast area – see armyworms.

**Spray:**
- Mexican bean beetle: Parathion wp, 1 lb. 15%

**Dust:**
- Parathion 1%  
- Rotenone 3/4-1%  
- Methoxychlor 5%

Apply when damage becomes evident. Spot control may be effective if infestation is found early.

**Spray:**
- Serpentine leaf miner: Parathion wp, 1 lb. 15%

**Dust:**
- Parathion 1%  
- toxaphene 2%

Apply before infestations seem general; 1 to 2 applications at 7-day intervals should be sufficient. Parathion is generally considered more effective.

Note comments on toxaphene on pole beans in West Coast area – see armyworms.

Parathion is the recommended material in the Sanford and West Coast areas. In the Everglades area it is noted that toxaphene used for the control of other insects may reduce the serpentine leaf miner problem.

**Spray:**
- Thrip: DDT wp, 1 qt. 25%

**Dust:**
- DDT 5%  
- toxaphene 10%

Thrips feeding on leaves and pods do most injury. It may be advisable to apply when thrips appear in great abundance (12-20 per flower). Repeat with 1 to 3 applications at 7-day intervals. Attempt thorough coverage just before blooming.

Note comments on toxaphene on pole beans in West Coast area – see armyworms.

**Spray:**
- Stink bug: toxaphene wp, 2½ lbs. 40%  
- Parathion wp, 1 lb. 15%

**Dust:**
- toxaphene 10%  
- Parathion 1%

Apply when insects appear. Especially important to insure low population when pods begin to set.

Note comments on toxaphene on pole beans in West Coast area – see armyworms.

Lesser cornstalk borer

In the Everglades area use aldrin 1 pound technical per acre; spray in 100 gallons water; use wetting agent or detergent in spray water to help wet soil and webbing; apply before cultiva-
tion that throws soil to base of plants. In West Coast area DDT or chlordane at 1 1/2 lbs. actual material per acre as a spray or dust is recommended at the time young plants break through the ground.

**CELERY**

**Aphid**

Spray:
- Parathion wp, 1 lb. 15%
- DDT em, 1 qt. 25%
- Nicotine sulfate, 1 pt. 40%

Dust: Parathion 1%

Aphids transmit mosaic, which makes their control important. Keep ditches and roadways free of weeds and watch closely for aphids. Under some conditions DDT emulsion causes injury to small seedlings and should be used with caution on young plants. Good coverage is essential. Nicotine sulfate is generally less effective than other materials.

**Armyworm**

Spray:
- Toxaphene wp, 3 lbs. 40%
- DDT em, 1 qt. 25%

**Garden flea hopper**

Spray:
- DDT wp, 2 lbs. 50%

**Green cutworm**

Spray:
- Toxaphene wp, 3 lbs. 40%

Dust:

The green cutworm cannot be controlled with DDT. To control this pest, use toxaphene and adjust one nozzle to spray directly into hearts of plants. Toxaphene also controls other cutworms and armyworms.

**Leaf miner**

Spray:
- Parathion wp, 1 lb. 15%
- TMF em ½ pt. 40%

Dust: Parathion 1%

Leaf tiers cannot be reached very well with power sprayers. They feed in buds and inner stems and spin a protective web over themselves. Use power duster and force dust into the celery heart.

**Thrip**

Spray:
- DDT em, 1 qt. 25%

**Leaf tier**

Spray:
- DDT 5%

**Sweet Corn**

**Budworm and Fall armyworm**

Spray:
- DDT wp, 1 qt. 25%
- Toxaphene wp, 2½ lbs. 40%

Dust: DDT 5%

Make first application for budworms when feeding is observed. Repeat at one to two-week intervals, depending on severity of infestation. Direct the spray or dust into the bud-whorl and from each side of the plant to the upper leaves.

**Cutworm**

Spray:
- Toxaphene wp, 2½ lbs. 40%

Dust: Toxaphene 5%
Use dust, spray, or bait as pre-emergence treatments. After plants are growing apply bait at rate of 30 lbs. per acre.

**Spray:**
- **Earworm**
  - DDT wp, 2 lbs., 50%
  - DDT em, 2 qts., 25%

**Dust:**
- **Earworm**
  - DDT 5%
  - Parathion 1-2%

**Earworm** infestations become heavier as the spring season progresses. For corn silking in mid-spring, apply 4 qts., 25% DDT emulsion in 50 gallons of water per acre. Five to six applications will be needed at 48 hour intervals.

Earworm infestations are heaviest in late spring. Mix 2.5 gallons of white mineral oil with 4 qts. of 25% DDT emulsion in 50 gallons of water with agitator running. Make 5 to 6 applications.

**Silk fly**
- **Spray:**
  - Parathion wp, 2 lbs., 15%
  - Chlordane wp, 2 lbs., 50%

**Dust:**
- **Silk fly**
  - Parathion 1-2%

Make first application just before silking. One to three applications may be needed.

**Lantern fly**
- **Spray:**
  - Toxaphene wp, 2 1/2 lbs., 40%

**Dust:**
- **Lantern fly**
  - Toxaphene 5%

Apply aldrin or heptachlor at 2 to 4 lbs. technical or chlordane at 4 to 5 lbs. technical per acre 2 weeks before planting. Distribute evenly over the surface and disk into soil to a depth of 6 inches. These materials mixed with fertilizers are generally less preferable than application by the above method.

CRUCIFER

**Aphid, Serpentine leaf miner**
- **Spray:**
  - Parathion wp, 1 lb., 15%
  - TEPP em, 1/2 pt., 40%

**Dust:**
- **Aphid, Serpentine leaf miner**
  - Parathion 2%
  - TEPP 1%

**Looper, Diamond-back moth larvae, Imported cabbage worm, Cabbage webworm, Corn earworm, Flea beetle**

CRUCIFER

**Spray:**
- **Looper, Diamond-back moth larvae, Imported cabbage worm, Cabbage webworm, Corn earworm, Flea beetle**
  - DDT em, 1 qt., 25%
  - Toxaphene wp, 2 1/2 lbs., 40%

**Dust:**
- **Looper, Diamond-back moth larvae, Imported cabbage worm, Cabbage webworm, Corn earworm, Flea beetle**
  - DDT 5%
  - Toxaphene 10%

In the Everglades area the imported cabbage worm continues to show resistance to DDT. It is reported that best control of this species has been with a combination spray of 3/4 lb. parathion 15% wp plus 1 1/2 lbs. toxaphene 40% wp per 100 gallons, but toxaphene 40% wp at 2 1/2 lbs. per 100 gallons and parathion 15% wp 1 lb. per 100 gallons have been practically as effective as the combination.

**Wireworm**

**Soil**—Fifty lbs. 10% chlordane granular or equiv. per acre, distributed evenly on the soil surface and disked into the soil.
Fertilizer mixture—Mix enough chlordane, wettable or dust, in fertilizer to supply 4 to 5 lbs. of active ingredient per acre. Not so effective as the above treatment.

**Mole-cricket**

**Bait:** 1.5-2% chlordane-wheat bran at rate of 50 lbs. per acre. Moisten bait and distribute late in the afternoon.

**Drenches**—For mole cricket control in seedbeds chlordane emulsion, 5 oz. 40% or equiv. per 100 gals. water per 1,000 sq. ft. of area. Drench treatment is not generally used in the Hastings area.

**Soil**—Treatment same as for wireworms.

**Fertilizer mixture**—Treatment same as for wireworms.

**CUCURBITS**

(Cantaloupes, Cucumber, Squash and Watermelon)

### Aphids, Melonworm, Pickleworm, Serpentine leaf miner, Squash bug

**Spray:**
- Parathion wp, 1 lb. 15%
- Lindane wp, 1 lb. 25%

**Dust:**
- Parathion 1%
- Lindane 1.5%

Begin applications when the first blooms appear, usually before insects or injury become apparent. Repeat at 10-day to 2-week intervals.

To avoid injury to bees which are necessary for pollination, spraying or dusting with insecticides should be delayed until late afternoon or evening. In the West Coast area it is suggested that parathion spray be applied early enough that it dries before dew-fall, reducing possibilities of foliage burn. Do not apply parathion when plants are wet; do not apply on very young plants.

TEPP, 1 pt. 20% or equivalent per 100 gallons, is a suitable aphicide which volatilizes very rapidly and leaves no residue problem; this same volatile nature increases the importance of thorough and timely coverage for effective aphid control. TEPP is not suggested for cucurbits in West Coast area.

### Cucumber beetle

**Spray:**
- Lindane wp, 1 lb. 25%

**Dust:**
- Lindane 1.5%

Apply when insects appear or injury is noted. Cucumber beetles are more likely to be troublesome in the Everglades and some Lower East Coast areas.

### Corn earworm

Feeding as a rindworm, this insect has been quite troublesome on watermelons in Central Florida. Parathion applied on the schedule suggested above may give a measure of control. DDT is a specific control for this insect, but foliage burn and possible reduced yield has been reported following use of DDT on cucurbits.

### NIPPLE PLANT

**Aphid**

**Spray:**
- Parathion wp, 1 lb. 15%
- TEPP em, 1 pt. 20%

**Dust:**
- Parathion 1%

Begin applications when aphids appear; repeat at 10-day to 2-week intervals.

TEPP is a suitable aphicide and miticide which volatilizes very rapidly and leaves no residue problem; this same volatile nature increases the importance of thorough and timely coverage for effective control.
**Cutworm**  
**Spray:**  
- Toxaphene wp, 2\(\frac{1}{2}\) lbs. 40%  
- Chlordane wp, 2\(\frac{1}{2}\) lbs. 40%  
**Dust:**  
- Toxaphene 10%  
- Chlordane 5%  
**Bait:**  
- Toxaphene 2%  
- Chlordane 1\(\frac{1}{2}\)-2%  

Apply before planting if worms are present or at first signs of worm damage to young plants. Check field carefully for worms before planting; if worms are found use bait. A home-made bait can be prepared by thoroughly mixing 3 or 4 pounds of wettable chlordane or toxaphene with 100 pounds of wheat bran. Moisten slightly just prior to applying. Best to apply bait in late afternoon.

**Flea beetle**  
**Spray:**  
- DDT wp, 2 lbs. 50%  
**Dust:**  
- DDT 5%  

Begin applications when insects appear; usually most severe on young plants.

**Red spider (mite)**  
**Spray:**  
- Parathion wp, 2 lbs. 15%  
- TEPP em, 1 pt. 20%  
**Dust:**  
- Parathion 1%  
- Sulfur, 325 mesh  

Begin applications when red spiders appear. Sulfur does not control some species of mites. Repeated applications of parathion or TEPP may be used if sulfur is not effective. A sulfur-parathion dust is also suggested in the West Coast area. See statements on TEPP under aphids.

**Thrip**  
**Spray:**  
- DDT em, 1 qt. 25%  
- DDT wp, 2 lbs. 50%  
**Dust:**  
- DDT 5%  

Sulfur may be used as the diluent for DDT dust, thus getting a dual-purpose dust.

**Leaf miner**  
**Spray:**  
- Parathion wp, 1 lb. 15%  
**Dust:**  
- Parathion 1%  

Apply when infestation appears; 1 to 2 applications at 7-day intervals should be sufficient.

**Escarole**

**Cutworm**  
**Spray:**  
- Toxaphene wp, 2\(\frac{1}{2}\) lbs. 40%  
- Chlordane wp, 2\(\frac{1}{2}\) lbs. 40%  
**Dust:**  
- Toxaphene 5%  
- Chlordane 5%  
**Bait:**  
- Toxaphene 2%  
- Chlordane 1\(\frac{1}{2}\)-2%  

Apply when damage is noted. If possible prepare land at least a month before planting and apply bait or other insecticide a week before seeding or transplanting. If toxaphene 10% dust is used reduce the amount applied per acre. Toxaphene dust and spray may injure very young seedlings or newly transplanted escarole.

**Wireworm**  
Chlordane 5 lbs. tech, or actual per acre applied broadcast and disked into top 2-3" of soil surface is recommended. Chlordane-fertilizer mixture containing 5 lbs. technical or actual chlordane per acre may be used, but for general purposes the broadcast method is preferred.
Aldrin (or heptachlor Homestead) at 3 lbs. technical per acre may be used in place of chlordane.
Transplant within 48-72 hours after insecticide application. Direct seeding may immediately follow application.

**Lettuce**

**Cutworm**  
**Spray:**  
- Toxaphene wp, 2\(\frac{1}{2}\) lbs. 40%  
- Chlordane wp, 2\(\frac{1}{2}\) lbs. 40%  
**Dust:**  
- Toxaphene 5%  
- Chlordane 5%  
**Bait:**  
- Toxaphene 2%  
- Chlordane 1\(\frac{1}{2}\)-2%  

Apply when damage is noted. If possible prepare land at least a month before
planting and apply bait or other insecticide a week before seeding or transplanting. If toxaphene 10% dust is used reduce the amount applied per acre. Toxaphene dusts and sprays may injure young seedlings or newly transplanted lettuce.

**Banded cucumber**

<table>
<thead>
<tr>
<th>Spray:</th>
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<tbody>
<tr>
<td>DDT wp, 2 lbs. 50%</td>
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<td>Chlordane wp, 2 1/3 lbs. 40%</td>
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Apply when insects or damage are noted.

**Lygus bug**

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Apply when damage is noted. DDT is not recommended in the Homestead area.

**Mole-cricket**

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<th>Bait:</th>
</tr>
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<td>Chlordane 1 1/2-2%</td>
</tr>
</tbody>
</table>

Apply several days before seeding or transplanting crop if mole cricket tunnels are evident. Apply bait in late afternoon when soil is moist and warm.

**Wireworm**

Chlordane 5 lbs. tech. or actual per acre applied broadcast and disked into top 2-3" of soil surface is recommended. Chlordane-fertilizer mixture containing 5 lbs. tech. or actual chlordane per acre may be used, but for general purposes the broadcast method is preferred.

- Aldrin (or heptachlor Homestead) at 3 lbs. technical per acre may be used in place of chlordane.
- Transplant within 48-72 hours after insecticide application.
- Direct seeding may immediately follow application.

**OKRA**

**Aphid**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Parathion wp, 1 lb. 15%</td>
<td>Parathion 1%</td>
</tr>
<tr>
<td>TEPP em, 1 pt. 20%</td>
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</tr>
</tbody>
</table>

Begin applications when aphids appear; repeat at 10-day to 2-week intervals.

TEPP is a suitable aphicide which volatilizes very rapidly and leaves no residue problem; this same volatile nature increases the importance of thorough and timely coverage for effective aphid control.

**Okra caterpillar**

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<td>Toxaphene wp, 2 1/3 lbs. 40%</td>
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</table>

Apply when infestation or leaf injury is first noted.

**Serpentine leaf miner**

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<td>Toxaphene wp, 2 1/3 lbs. 40%</td>
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</table>

Apply when infestation seems general; 1 to 2 applications at 7-day intervals should be sufficient. Parathion usually considered more effective.

**Stink bug**

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<tr>
<td>Toxaphene wp, 2 1/3 lbs. 40%</td>
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<td>Parathion wp, 1 lb. 15%</td>
<td>Parathion 1%</td>
</tr>
</tbody>
</table>

Apply when insects appear.
**ONION**

**Aphid and Leaf miner**

**Spray:**
- Parathion wp, 1 lb, 15%
- Lindane wp, 1 lb, 25%

**Dust:**
- Parathion 1%
- Lindane 1.5%

**Thrip**

**Spray:**
- Parathion wp, 1 lb, 15%
- DDT em, 1 qt, 25%

Apply when thrips appear; repeat when necessary. Use 250-300 lbs. pressure and direct nozzles over rows close to plants. Addition of spreader to spray is suggested; coverage down into sheaths very important.

**Cutworm**

**Spray:**
- 
- 

Apply in late afternoon.

**ENGLISH PEA**

**Aphid**

**Spray:**
- Parathion wp, 1 lb, 15%
- Lindane wp, 1 lb, 25%

**Dust:**
- Parathion 1%
- Lindane 1.5%

Begin applications as soon as aphids appear; repeat at 10-day intervals as needed.

It has been noted that adequate coverage with sprays may be difficult.

**SOUTHERN PEA**

**Pod weevil**

**Spray:**
- Toxaphene wp, 2½ lbs, 40%
- Parathion wp, 1 lb, 15%

**Dust:**
- Toxaphene 5%
- Parathion 1%

Apply when pods begin to set and repeat weekly for at least three applications—suggested only if all pods will be shelled or if they are to be washed thoroughly before marketing.

**Serpentine leaf miner**

**Spray:**
- Parathion wp, 1 lb, 15%
- Toxaphene wp, 2½ lbs, 40%

**Dust:**
- Parathion 1%
- Toxaphene 10%

Apply when infestations seem general; 1 to 2 applications at 7-day intervals should be sufficient.

**Stink bug**

**Spray:**
- Toxaphene wp, 2½ lbs, 40%
- Chlordane wp, 2½ lbs, 40%
- Parathion wp, 1 lb, 15%

**Dust:**
- Toxaphene 10%
- Chlordane 5%
- Parathion 1%

Apply when insects appear. Especially important to insure low population when pods begin to set.

**Leaf-hopper and Leaf-roller**

**Spray:**
- DDT wp, 2 lbs, 50%

**Dust:**
- DDT 5%

Apply at first signs of leaf-hoppers, 1 to 3 applications at 10-day intervals, last treatment just before blooming.

In Everglades and Lower East Coast areas leaf-hoppers most severe in spring during warm dry periods; in Central and Northern Florida most prevalent in the fall. Young plants suffer most.

One treatment should be sufficient for leaf-rollers. Wait for fairly heavy pop-
ulation before applying insecticide. Dust borders of large field with airplane. Usually not necessary to treat whole field unless small or infestation severe.

Lesser cornstalk borer

In the Everglades area use aldrin at 1 pound technical per acre; spray in 100 gallons water; use wetting agent or detergent in spray water to help wet soil and webbing; apply before cultivation that throws soil to base of plants. In West Coast area DDT or chlordane at 1½ lbs. actual material per acre as a spray or dust is recommended at the time young plants break through the ground.

PEPPER

Aphid

Spray:
Parathion wp, 1 lb. 15%
DDT em, 1 qt. 25%

Dust:
Parathion 1%

Apply parathion when aphids are discovered and repeat at weekly intervals or as needed. A regular schedule using DDT emulsion usually holds aphids under control, but is not effective against established infestations.

Aphids may transmit certain viruses which cause mosaic diseases.

Corn earworm

Spray:
DDT em, 1 qt. 25%

Reported to be a major pest in the West Coast area.

Fall armyworm

Spray:
DDT em, 1 qt. 25%

Apply when worms appear and at intervals of about 10 days if infestation continues.

Penner weevil

Spray:
DDT em, 1 qt. 25%

Apply when infestation becomes evident. Watch for fallen blossom buds and small fruits as indications of infestations.

Thrip

Spray:
DDT em, 1 qt. 25%

Apply when thrips are noted in blooms; repeat with 1 to 3 applications at 7-day intervals. Attempt thorough coverage just before blooming.

Nicotine sulfate emulsion, 1 pt. 40%, or a nicotine 3% dust, gives flower thrip control and is suggested for use in the West Coast area; nicotine is not effective in cool weather (below 60°F) and should be applied when the air is calm.

Mole-cricket

Spray:
Chlordane wp, 2½ lbs. 40%

Bait:
Chlordane 5%
Chlordane 1½-2%

Apply several days before seeding or transplanting crop if mole cricket tunnels are evident. Apply bait in late afternoon when soil is moist and warm.

For seedbeds use poison bait or drench with solution of ½ lb. actual chlordane in 100 gallons water in sprinkling can to 1,000 sq. ft. of seedbed area.

Cutworm

Spray:

Dust:

Apply in late afternoon.
### Irish Potato

<table>
<thead>
<tr>
<th>Insect</th>
<th>Spray</th>
<th>Dust</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aphid</strong></td>
<td>DDT em, 1 qt. 25%</td>
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<tr>
<td></td>
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<td>TEPP 1%</td>
</tr>
<tr>
<td></td>
<td>TEPP em, ½ pt. 40%</td>
<td></td>
</tr>
<tr>
<td><strong>Armyworm, Cutworm</strong></td>
<td>DDT em, 1 qt. 25%</td>
<td>Parathion 1%</td>
</tr>
<tr>
<td></td>
<td>Chlordane em, 1 pt. 75%</td>
<td>TEPP 1%</td>
</tr>
<tr>
<td></td>
<td>Toxaphene em, 1 pt. 70%</td>
<td></td>
</tr>
<tr>
<td><strong>Colorado potato beetle</strong></td>
<td>DDT em, 1 qt. 25%</td>
<td></td>
</tr>
<tr>
<td><strong>Large plant bug</strong></td>
<td>Chlordane em, 1 pt. 75%</td>
<td></td>
</tr>
<tr>
<td><strong>Leaf miner</strong></td>
<td>Parathion wp, 1 lb. 15%</td>
<td>Chlordane 5%</td>
</tr>
<tr>
<td></td>
<td>EPN wp ½ lb. 27% (Homestead)</td>
<td></td>
</tr>
<tr>
<td><strong>Wireworm</strong></td>
<td>Chlordane at 4 lbs. or aldrin at 3 lbs. active ingredient (or 3 lbs. heptachlor Homestead) per acre sprayed on the soil surface and disked in prior to planting.</td>
<td></td>
</tr>
</tbody>
</table>

For the Hastings area DDT emulsion applied in a regular schedule at intervals of 10 days to 2 weeks will control most potato insect pests, including aphids. Thus, where leaf miners, stink bugs, other plant bugs and armyworms are not a problem, DDT emulsion alone is a satisfactory potato insecticide for this area. It is not felt that TEPP is necessary for insect control in the Hastings area.

In the Homestead area parathion applied in a regular schedule of 7 to 10 days has controlled potato insects.

Aldrin has not been adequately tested in the Hastings area in 1953.

### Sweet Potato

<table>
<thead>
<tr>
<th>Insect</th>
<th>Spray</th>
<th>Dust</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Armyworm</strong></td>
<td>DDT wp, 2 lbs. 50%</td>
<td>DDT 5%</td>
</tr>
<tr>
<td></td>
<td>Toxaphene wp, 2½ lbs. 40%</td>
<td>Toxaphene 10%</td>
</tr>
<tr>
<td><strong>Gold bug</strong></td>
<td>DDT wp, 2 lbs. 50%</td>
<td></td>
</tr>
<tr>
<td><strong>Leaf-eating caterpillar</strong></td>
<td>DDT wp, 2 lbs. 50%</td>
<td>DDT 5%</td>
</tr>
<tr>
<td></td>
<td>Chlordane wp, 2½ lbs. 40%</td>
<td>Chlordane 5%</td>
</tr>
<tr>
<td></td>
<td>Toxaphene wp, 2½ lbs. 40%</td>
<td>Toxaphene 10%</td>
</tr>
</tbody>
</table>

Begin applications when insects appear; 1 to 2 applications usually sufficient.

**Sweet potato weevil** Sanitation. Use certified or weevil-free seed.
White-fringed beetle Adherence to quarantine. It has been reported that 5 lbs. technical DDT per acre, mixed into soil, prevents breeding of this insect for 5 years.

RADISH, TURNIP and MUSTARD

Spray:
TEPP em, 1 pt. 20%

Dust:

TEPP is a suitable aphicide which volatilizes very rapidly and leaves no residue problem; this same volatile nature increases the importance of thorough and timely coverage for effective aphid control.

Cutworm

Spray: --

Dust: --

Bait: Toxaphene 2%

Chlordane 1½-2%

Mole-cricket

Spray: --

Dust: --

Bait: Chlordane 1½-2%

Apply before seeding.

(In the West Coast area, if there is no residue problem, DDT is suggested to control cutworm, wooly bear, and cabbage looper and parathion for aphid control.)

SPINACH

Caterpillar and other chewing insects

Spray: TDE (DDT) wp, 2 lbs. 50%

Dust: TDE (DDD) 5%

Rotenone 3½%

Pyrethrum 4½%

Apply when insects or injuries appear.

STRAWBERRY

Spray:

Flower thrip

Nicotine sulfate em, 1 pt. 40%

Nicotine 3%

Nicotine is not effective in cool weather (below 60° F.) and should be applied when the air is calm.

Leaf roller, Cutworm, DDT wp, 2 lbs. 50%

Lesser cornstalk borer

Apply when insects are first noted. Do not use DDT when plants are blooming.

Red spider

Sulfur wp, 10 lbs.

Apply when mites appear; usually more likely to cause severe injury during periods of dry weather. Main point to consider is to get adequate coverage on underside of leaves.

Spray:

Mole-cricket, Field cricket, Grasshopper

Chlordane wp, 2½ lbs. 40%

Chlordane 5%

Chlordane 1½%
being injured.

Chlordane dusts and baits are most effective when the soil is moist. If it is necessary to treat in dry weather, irrigate after application of spray and dust, but before applying bait. Treat for mole crickets several days before transplanting. Apply bait in late afternoon during warm weather.

**TOMATO**

<table>
<thead>
<tr>
<th></th>
<th><strong>Spray:</strong></th>
<th><strong>Dust:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Southern armyworm</strong></td>
<td>DDT wp, 2 lbs. 50%</td>
<td>DDT 5%</td>
</tr>
<tr>
<td><strong>Tomato fruitworm</strong></td>
<td>TDE wp, 2 lbs. 50%</td>
<td>TDE 5%</td>
</tr>
<tr>
<td><strong>Fall armyworm and Banded cucumber beetle</strong></td>
<td>Chlordane wp, 2 lbs. 50%</td>
<td>Chlordane 5%</td>
</tr>
</tbody>
</table>

**Cutworm**

<table>
<thead>
<tr>
<th></th>
<th><strong>Spray:</strong></th>
<th><strong>Dust:</strong></th>
<th><strong>Bait:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DDT wp, 2 lbs. 50%</td>
<td>DDT 5%</td>
<td>2-2 1/2 Chlordane-wheat bran (30-50 lbs per acre)</td>
</tr>
<tr>
<td></td>
<td>TDE wp, 2 lbs. 50%</td>
<td>TDE 5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chlordane wp, 2 lbs. 50%</td>
<td>Chlordane 5%</td>
<td></td>
</tr>
</tbody>
</table>

For the control of soil-infesting cutworms and mole crickets the insecticidal spray or dust should be distributed evenly over the soil surface. Baits should be moistened and distributed in late afternoons.

**Serenstine leaf miner and Aphid**

<table>
<thead>
<tr>
<th></th>
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<th><strong>Dust:</strong></th>
<th><strong>Bait:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parathion wp, 1 lb. 15%</td>
<td>Parathion 1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lindane wp, 1 lb. 25%</td>
<td>Lindane 1%</td>
<td></td>
</tr>
</tbody>
</table>

**Field cricket**

<table>
<thead>
<tr>
<th></th>
<th><strong>Spray:</strong></th>
<th><strong>Dust:</strong></th>
<th><strong>Bait:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chlordane wp, 2 lbs. 50%</td>
<td>Chlordane 5%</td>
<td>2-2 1/2 Chlordane-wheat bran (30-50 lbs per acre)</td>
</tr>
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</table>

For the control of soil-infesting cutworms and mole crickets the insecticidal spray or dust should be distributed evenly over the soil surface. Baits should be moistened and distributed in late afternoons.

**Tomato hornworm**

<table>
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<th><strong>Dust:</strong></th>
<th><strong>Bait:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parathion wp, 1 lb. 15%</td>
<td>Parathion 1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TDE wp, 2 lbs. 50%</td>
<td>TDE 5%</td>
<td></td>
</tr>
</tbody>
</table>

**Stink bug and Leaf-footed bug**

<table>
<thead>
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<th></th>
<th><strong>Spray:</strong></th>
<th><strong>Dust:</strong></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Parathion wp, 1 lb. 15%</td>
<td>Parathion 1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TDE wp, 2 lbs. 50%</td>
<td>TDE 5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chlordane wp, 2 lbs. 50%</td>
<td>Chlordane 5%</td>
<td></td>
</tr>
</tbody>
</table>

**Flower thrip**

Treat only if population is large.

Wireworm

Apply 5 pounds of chlordane technical per acre 10 to 14 days before planting. Distribute material evenly over the soil surface and disk well into soil. The same amount of chlordane
may be added with fertilizer, but results are generally less satisfactory.

Very truly yours,

F. S. JAMISON
Vegetable Crop Specialist