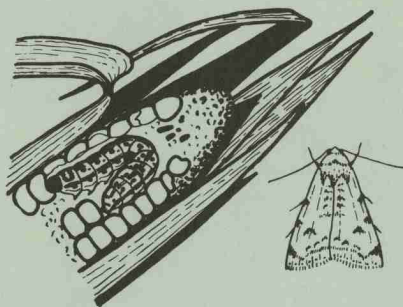


# Vegetable Insect Control 1968

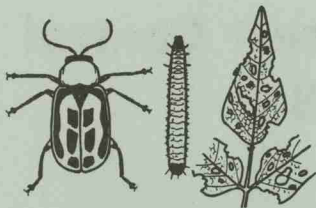


Corn Earworm

DOCUMENTS

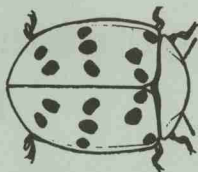
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Duke University Library



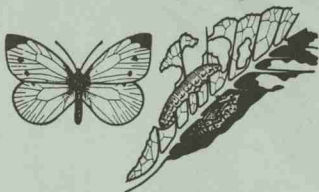
#### BEAN LEAF BEETLE

Adult— $\frac{1}{4}$ " long. Beetles reddish to yellowish color with 6 black spots. Larva— $\frac{3}{8}$ " long, slender, white with black head and tail.



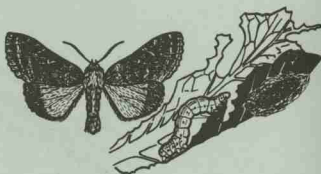
#### MEXICAN BEAN BEETLE

Adult— $\frac{1}{2}$ " long. Brownish color with 16 black spots arranged in 3 rows across back. Larva— $\frac{1}{2}$ " when full grown. Lemon yellow with spines on back.



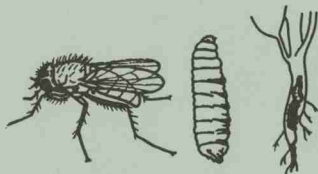
#### IMPORTED CABBAGEWORM

Adult—White butterfly with 3 or 4 black markings and wingspread of about 2". Larva— $1\frac{1}{2}$ " when full grown, velvety green with 3 thin gold colored stripes.



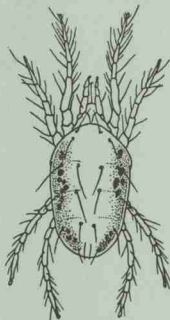
#### CABBAGE LOOPER

Adult—Brownish, silver colored markings on front wings. Wingspread  $1\frac{1}{2}$ ". Larva—Greenish colored "looper"  $1\frac{1}{2}$ " long, 4 white lines along the body.



#### CABBAGE MAGGOT

Adult— $\frac{1}{4}$ " long, gray, two-winged flies. Larva— $\frac{1}{4}$ " long when full grown. White, wedge-shaped maggots. Feeds on roots of cabbage and related crops.



#### SPIDER MITE

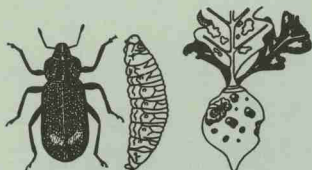
Adult—reddish, yellowish or greenish, 4 pairs of legs. Body oval in outline,  $\frac{1}{16}$  to  $\frac{1}{20}$  inch. Young resemble adults but are smaller.

## VEGETABLE INSECTS

H. E. SCOTT, Extension and CHARLES H. BRETT, Research

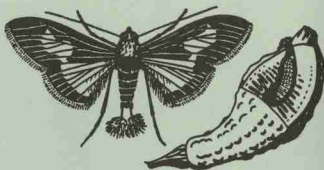
Crop	To Control	Sprays (Amount per acre)	Dusts (25 to 30 Lb. per acre)	Remarks
Beans Apply insecticide to under side of leaves.	Bean leaf beetle	DDT 50% WP 3 lb.	DDT 5%	7 days*
		Methoxychlor 50% WP 3 lb.	Methoxychlor 5%	3 days*
		Rotenone 5% 5 lb.	Rotenone 1%	1 day*
	Corn earworm	Carbaryl (Sevin) 50% WP 3 lb.	Carbaryl (Sevin) 5%	No time limitations*
		DDT 50% WP 3 lb.	DDT 5%	7 days*
		Methoxychlor 50% WP 3 lb.	Methoxychlor 5%	3 days*
	Leafhoppers	Methoxychlor 50% WP 3 lb.	Malathion 3% Plus Methoxychlor 3%	3 days*
		Malathion 25% WP 6 lb.	Methoxychlor 5%	
	Mexican bean beetle	Carbaryl (Sevin) 50% WP 1 lb.	Malathion 4 or 5%	1 day*
			Carbaryl (Sevin) 5%	No time limitations*
		Guthion 25% WP 2 lb.	Guthion 3% (Apply 15-20 lb. per acre)	7 days*
		Methoxychlor 50% WP 3 lb.	Malathion 3% plus Methoxychlor 3%	3 days*
		Malathion 25% WP 6 lb.	Malathion 4 or 5%	1 day*
		Rotenone 5% 5 lb.	Rotenone 1%	1 day* Beetles in the Hendersonville area are resistant to rotenone. This may be true in other areas.
	Mexican bean beetle Leafhoppers Mites	Di-syston, 10% Granules 10-20 lb. per acre		Apply in Furrow at time of planting on-ly. Avoid contact with seed. Use lower dosage on light sandy soils to minimize plant injury. CAUTION: Do not use in the home garden. Apply only once per season.
Mexican bean beetle Spider mites	Carbophenothion (Trithion) 25% WP 3 lb.	Carbophenothion (Trithion) 2%	7 days*	
		Ethion 4%	4 days*	
Spider mites	Kelthane 18.5% WP 3 lb.		7 days* Spray leaves thoroughly, especially undersides.	
Spotted cucumber beetle	Methoxychlor 50% WP 3 lb.	Methoxychlor 5%	3 days*	
		Rotenone 5% 5 lb.	Rotenone 1%	
		Carbaryl (Sevin) 50% WP 3 lb.	Carbaryl (Sevin) 5%	
Beets	Flea beetle Beet webworm	Carbaryl (Sevin) 50% WP 3 lb.	Carbaryl (Sevin) 5%	3 days* 14 days* if tops are used for food or feed
		Leaf miners	Diazinon 50% WP 1 lb.	Diazinon 2%
	Malathion 25% WP 6 lb.			7 days*

\*Number of days established as the minimum time between last application and harvest when applied at the specified rate. Some of the safer insecticides are designated as "No Time Limitation". Insecticide dosages apply only to vegetables for human consumption and not when plants are used for forage.  
 WP = wettable powder      EC = emulsifiable concentrate



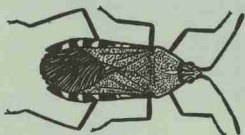
#### VEGETABLE WEEVIL

Adult— $\frac{1}{2}$ " long, grayish with a "V" shaped marking near rear of wings.  
Larva— $\frac{1}{2}$ " long when full grown. Greenish, slug-like creatures.



#### PICKLEWORM

Adult—Wingspread 1". Wings fragile, yellowish brown margins, white centers.  
Larva— $\frac{3}{4}$ ". White to greenish caterpillars with black spots. Heads brown.



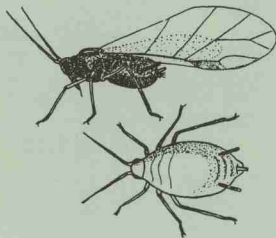
#### SQUASH BUG

Adult—About  $\frac{5}{8}$ ". Brownish-black to gray, flat across back. Top wings are leathery at base, membranous at the tips.  
Nymphs—Resemble adults, wingless, smaller.



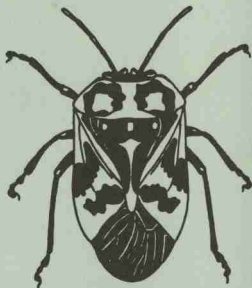
#### SQUASH VINE BORER

Adult—Wingspread  $1\frac{1}{2}$ ". Front wings have greenish-black scales, hind wings transparent. Abdomen has red rings and black scales. Larva—White, smooth. Brown head.



#### APHIDS OR PLANT LICE

Adults—Winged or wingless, soft bodied. Cornicles or tubes project from rear.  
Nymphs—Resemble adults but wingless. Small insects.



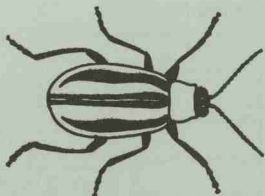
#### HARLEQUIN BUG

Adult—Flat, shield-shaped,  $\frac{3}{8}$ " long. Reddish or orange with black markings.  
Nymph—Resembles adult, but smaller and wingless.

## VEGETABLE INSECTS (continued)

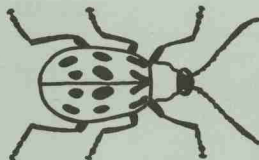
Crop	To Control	Sprays (Amount per acre)	Dusts (25 to 30 Lb. per acre)	Remarks
Cabbage Broccoli	Cabbage maggot (occurs only in mountain area)		Chlordane 5%	Apply to soil at base of plants when leaves appear. Repeat after transplanting or thin- ning. Insect resist- ance has occurred in the Boone area.
		Diazinon EC 2-3 lb. active ingredient per acre		Broadcast and disc into the soil 3-4 inches before planting.
		Diazinon 50% WP 4-6 lb.		For cabbage or broc- coli only.
		Diazinon 50% WP add 1/2 lb. to 50 gallons of water. Apply 1/2-1 cupful per plant.		
	Guthion 25% WP 3/4 lb. in 50 gallons water. Apply 1 cupful per plant at or immediately after transplanting. For cabbage or broc- coli.			
Aphids	Malathion 25% WP 6 lb.	Malathion 4 or 5%	7 days*	
	Mevinphos (Phosdrin) 25.4% EC 1 qt.	Mevinphos (Phosdrin) 2% (20-25 lb./A.)		1 day* broccoli and cabbage. 3 days* col- lards, turnip tops, and mustard greens.* CAUTION: Do not use in the home garden.
	Lindane 25% WP 1 lb.	Lindane 1%		Do not use after edible portions form.
Cabbage looper and other caterpillars	DDT 25% EC 1 qt. plus Guthion 2E 1 qt.			Cabbage: 21 days*. Strip outer leaves.
	Naled (Dibrom) 60% EC 1 qt.	Naled (Dibrom) 4%		4-days* (dust). Ap- ply at 7-day inter- vals. 1 day* (E.C.)
	Mevinphos (Phosdrin) 25.4% EC 1 qt.	Mevinphos (Phosdrin) 2%		1 day* broccoli and cabbage. 3 days* col- lards, turnip tops, and mustard greens.* CAUTION: Do not use in the home garden.
Flea beetle Imported cabbageworm Cross striped cabbageworm Diamond back caterpillar	Toxaphene 40% WP 6 lb.	Toxaphene 10%		Cabbage: 7 days toxaphene*. 14 days DDT.* If outer leaves are to be strip- ped at harvest time, otherwise do not apply after heads begin to form. Apply at 7 day intervals to control caterpillars.
	DDT 50% WP 3 lb.	DDT 5%		Broccoli: DDT, not after edible parts form. Toxaphene 30 days.*
	Rotenone 5% 5 lb.	Rotenone 1%		1 day*
Harlequin bug		Sabadilla 20%		No time limitations*
	Malathion 25% WP 6 lb.	Malathion 4 or 5%		7 days*
Vegetable weevil	Lindane 25% WP 1 lb.	Lindane 1%		Do not use after edible portions form.
	Rotenone 5% 5 lb.	Rotenone 1%		1 day*

\* Number of days established as the minimum time between last application and harvest when applied at the specified rate. Some of the safer insecticides are designated as "No Time Limitations." Insecticides dosages apply to vegetables for human consumption and not when plants are used for forage.  
WP = Wettable Powder  
EC = Emulsifiable Concentrate



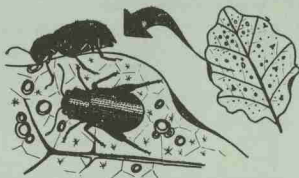
#### STRIPED CUCUMBER BEETLE

Adult—About 1/5" long, yellow with 3 longitudinal black stripes on top wings. Larva—Whitish, about 1/8" when grown. Feeds on the roots of plants.



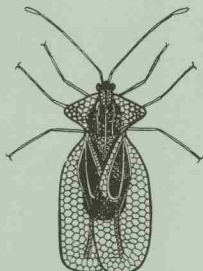
#### SPOTTED CUCUMBER BEETLE

Adult—Yellowish-green with 11 black spots. Head and antennae black. Larva—Yellowish-white, brown headed, 3/4" long when grown.



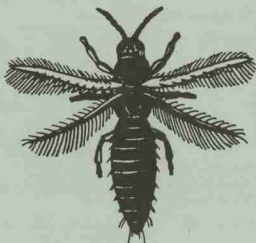
#### FLEA BEETLES

Adults—Small dark beetles that jump like fleas. Many species about 1/16" long. Larva—White-bodied, brown headed, cylindrical, about 1/5" when full grown.



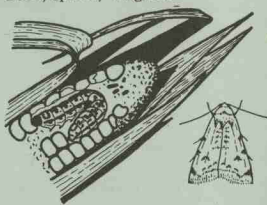
#### LACE BUGS

Adults—Small, flat, rectangular shaped, semi-transparent wings with net-like appearance. About 3/16" long. Nymphs—Dark, spined, wingless.



#### THRIPS

Adults—slender louse-like, about 1/20" long, vary from light to dark brown. Wings narrow with fringe of hair. Nymphs—Lighter, smaller and wingless.



#### CORN EARWORM

Adult—Grayish-brown, darker areas near wing tips, 1 1/2" wingspread. Larva—Brown to green or even pink. About 2" long with yellow heads.

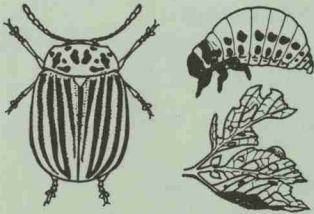
## VEGETABLE INSECTS (continued)

Crop	To Control	Sprays (Amount per acre)	Dusts (25 to 30 Lb. per acre)	Remarks
Cantaloupes				See cucumbers.
Collards				See leaf crops
Cucumber (Squash)	Aphids	Lindane 25% WP 1 lb.	Lindane 1%	Direct spray to under- side of leaves. 1 day*
		Naled (Dibrom) 60% EC 1 qt.	Naled (Dibrom) 4%	4-days* (dust). 1 day* (E.C.).
		Malathion 25% WP 6 lb.	Malathion 4 or 5%	1 day*
Melonworm Pickeworm		Lindane 25% WP 1 lb.	Lindane 1%	1 day*
		Carbaryl (Sevin) 50% WP 1 lb.	Carbaryl (Sevin) 2%	No time limitations*
		Methoxychlor 50% WP 3 lb.	Methoxychlor 5%	1 day*
Squash bugs			Sabadilla 20%	Dust underside of leaves. No time limita- tions*
		Carbaryl (Sevin) 50% WP 1 lb.	Carbaryl (Sevin) 2%	No time limitations*.
Squash vine borer			Lindane 1%	1 day* Dust around base of plants. Can al- so be controlled by slitting one side of stem. Puncture worms with sharp knife. Mound dirt around stem and runner.
		Carbaryl (Sevin) 50% WP 1 lb.	Carbaryl (Sevin) 2%	
Striped and spotted cucumber beetles		Lindane 25% WP 1 lb.	Lindane 1%	1 day* Remove excess residue from cucum- bers and squash by washing.
		Methoxychlor 50% WP 3 lb.	Methoxychlor 5%	1 day*
		Rotenone 5% 5 lb.	Rotenone 1%	1 day*
			Endosulfan (Thiodan) 3%	No time limitations.
		Carbaryl (Sevin) 50% WP 1 lb.	Carbaryl (Sevin) 2%	No time limitations*
Corn	Corn earworm	DDT 25% EC 5 gal. in 100 gal. spray. (Apply 25 gal. per acre).		Control is more effec- tive on varieties with "worm resistance" such as Gold Pak, Victory Golden, and Golden Security. Apply to the silks when they first appear and repeat at 2-day intervals for 4 applications, then at 3-day intervals. No time limitations for Sevin. DDT treated corn may not be used for forage.
		Carbaryl (Sevin) 50% WP 16 lb. in 100 gal. spray. Apply 25 gal. per acre).		
			DDT 10%	Use dust for pre-silking applications into the whorl. This will avoid plant injury which is sometimes caused from sprays See above re- marks.
			Carbaryl (Sevin) 10%	

\* Number of days established as the minimum time between last application and harvest when applied at the specified rate. Some of the safer insecticides are designated as "No time limitations."  
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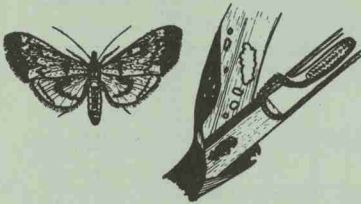
#### COLORADO POTATO BEETLE

Adult— $\frac{3}{8}$ " long,  $\frac{1}{4}$ " wide. Ten black and 10 yellowish longitudinal stripes. Larva— $\frac{1}{2}$ " when grown. Reddish with two rows of black spots, humpbacked, soft.



#### POTATO LEAFHOPPER

Adult—pale green, about  $\frac{1}{8}$ " long. Nymphs greenish, resemble adults except they are smaller and wingless.



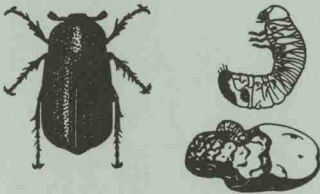
#### EUROPEAN CORN BORER

Adult—Pale yellowish with irregular dark bands across wings. Wingspread 1". Larva—Flesh colored, brown heads, brown spots on body. One inch long when grown.



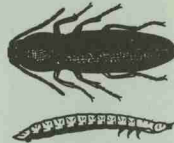
#### COWPEA CURCULIO

Adult— $\frac{1}{4}$ ". Black, humpbacked with snout. Larva— $1\frac{1}{5}$ " long, white, legless grubs, cylindrical with yellowish brown heads. Larvae develop inside the pod.



#### WHITE GRUBS

Adult—Dark brown to black, hard-shelled,  $\frac{1}{2}$  to 1" long. Larva—White with brown head. Usually rests in a "C" shape.



#### WIREWORMS

Adults—Elongate, hard-shelled, dull colored  $\frac{1}{2}$  to  $1\frac{1}{2}$ " long. Often called "click" beetles. Larva—Yellowish, tough bodied  $\frac{1}{2}$  to 2".



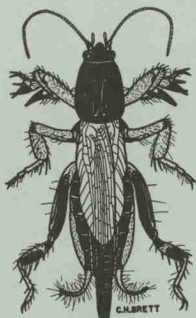
## VEGETABLE INSECTS (continued)

Crop	To Control	Sprays (Amount per acre)	Dusts (25 to 30 Lb. per acre)	Remarks
Corn (cont'd.)	Sap Beetles	Use resistant varieties such as Gold Pak or Triplegold.		
	Fall armyworm		Carbaryl (Sevin) 10% apply 20 lb. per acre DDT 10% Granular materials containing DDT, chlordane, or toxaphene.	No time limitations for carbaryl. Direct into whorl of plant. Corn harvest- ed after the latter part of July may be so heavily infested that good control is very difficult.
Eggplant	Colorado potato beetle Flea beetle	DDT 50% WP 3 lb.	DDT 5%	5 days* Remove excess residue at time of har- vest by washing or brushing.
		Carbaryl (Sevin) 50% WP 3 lb.	Carbaryl (Sevin) 5%	No time limitations.*
	Lace bugs Spider mites	Malathion 25% WP 6 lb.	Malathion 4 or 5%	3 days*
Kale				See leaf crops
Leaf Crops collards, kale, mustard greens, Spinach, turnip greens	Aphids, cabbage worms, loopers	Malathion 57% E.C. 1 qt.	Malathion 4%	7 days* 3 days*—turnip greens only
		Naled (Dibrom) 60% EC 1 qt.	Naled (Dibrom) 4%	4 days*
	cabbage worms, loopers	Carbaryl (Sevin) 50% WP 3 lb.	Carbaryl Sevin) 5%	14 days*
Lettuce	Aphids	Malathion 25% WP 6 lb.	Malathion 5%	7 days* head lettuce. 14 days* leaf lettuce.
		Naled (Dibrom) 60% EC 1 qt.	Naled (Dibrom) 4%	4-days*.
	Cabbage looper and other caterpillars	Naled (Dibrom) 60% EC 1 qt.	Naled (Dibrom) 4%	4-days*.
		Carbaryl (Sevin) 50% WP 3 lb.	Carbaryl (Sevin) 5%	head—3 days* leaf—14 days*
Mustard Green				See Leaf Crops
Okra	Corn earworm Stink bugs	Carbaryl (Sevin) 50% WP 3 lb.	Carbaryl (Sevin) 5%	No time limitations.*
Onions	Thrips	DDT 50% WP 3 lb	DDT 5%	Do not apply to green or spring onions.
		Diazinon 25% WP 1 to 2 lb.		10 days*.
		Dieldrin 25% WP 1½ to 2 lb.		14 days* Do not apply to green or spring onions.
		Malathion 25% WP 6 lb.	Malathion 5%	3 days*. Green or dry.
	Onion Maggot (Green or dry onions)	Add 4 lbs. 25% wettable dieldrin pre- pared as a slurry with thiram, to 100 lbs. of seed.		
	Diazinon 25% WP 1 to 2 lb.			Direct spray toward base of plants. Repeat at 7 day intervals as necessary. 10 days*.

WP = Wettable Powder

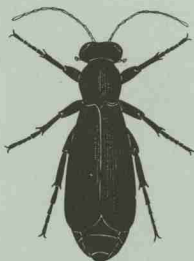
EC = Emulsifiable Concentrate

\* Number of days established as the minimum time between last application and harvest when applied at the specified rate. Some of the safer insecticides are designated as "No Time Limitations".  
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**MOLE CRICKET**

Velvety brown,  $1\frac{1}{2}$ " long. Front wings are short; hind wings long. Front legs developed for digging.  
Nymphs—Resemble adults.



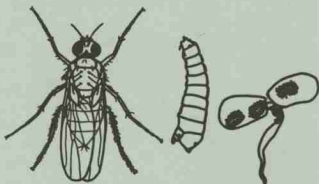
**BLISTER BEETLES**

Adults—Elongate, dark with neck-like region between head and base of wings. Some species are striped.  $\frac{1}{2}$  to 1" long.  
Larva—Yellow and about  $\frac{2}{5}$ " long.



**CUTWORMS**

Adult—Dull grayish or brownish front wings. Wingspread 1 to  $1\frac{3}{4}$ ". Larvae—Dull colored and curl into a tight "C" shape when disturbed.  $1\frac{1}{2}$ " long.



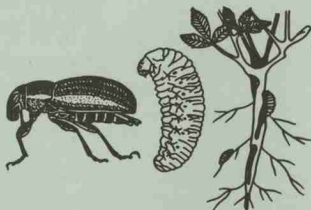
**SEED CORN MAGGOT**

Adult— $\frac{1}{5}$ " grayish-brown flies. Larva or maggot is wedge-shaped, legless, cream colored.  $\frac{1}{4}$ " long when full grown. Narrow end is the head.



**TOMATO HORNWORM**

Adult—Moth gray with 5 yellow spots on each side. Front wings have white and dark markings. Hind wings lighter.  
Larva—Green, 8 white "L" marks on side.  $3\text{--}3\frac{1}{2}$ " long when full grown.



**WHITE-FRINGED BEETLE**

Adult—Dark gray snout beetle with white marking on each side. About  $\frac{1}{2}$ " long. Larva—Grub-like and legless, white,  $\frac{1}{4}$ " long when grown. Feeds on plant roots.

## VEGETABLE INSECTS (continued)

Crop	To Control	Sprays (Amount per acre)	Dusts (25 to 30 Lb. per acre)	Remarks
Peas (English or Garden)	Aphids	Malathion 25% WP 6 lb.	Malathion 4 or 5%	3 days*
		Mevinphos (Phosdrin) 25.4% EC 1 qt.	Mevinphos (Phosdrin) 2% (20-25 lb./A.)	1 day* CAUTION: Do not use in the home garden.
		Rotenone 5% 5 lb.	Rotenone 1%	1 day*
		Demeton (Systox) 25% EC 1 pt.		21 days*
Peas (Field or Southern)	Aphids	Malathion 25% WP 6 lb.	Malathion 5%	3 days*
	Cowpea curculio	Methoxychlor 25% WP 6 lb.	Methoxychlor 5%	7 days*
		Toxaphene 40% WP 6 to 9 lb.	Toxaphene 10%	No time limitation* when hulls not con- sumed.
Peppers	Flea beetles	Methoxychlor 50% WP 3 lb.	Methoxychlor 5%	1 day*
		DDT, 50% WP 3 lb.	DDT 5%	5 days* Remove resi- due at time of harvest by washing or brush- ing.
		Carbaryl (Sevin) 50% WP 3 lb.	Carbaryl (Sevin) 5%	No time limitations.*
	Aphids	Malathion 25% WP 6 lb.	Malathion 4 or 5%	3 days*
		Dimethoate 2.67 E ¾ to 1 pt.		No time limitations.*
Potatoes (Irish)	Aphids	Malathion 25% WP 6 lb.	Malathion 5%	No time limitations.*
		Endosulfan (Thiodan) 50% WP 1 lb.	Endosulfan (Thiodan) 3%	No time limitations.*
	Blister beetles Colorado potato beetle Flea beetle Leafhoppers	Endosulfan (Thiodan) 50% WP 1 lb.	Endosulfan (Thiodan) 3%	No time limitations.*
		DDT 50% WP 3 lb.	DDT 5%	No time limitations.*
		Carbaryl (Sevin) 50% WP 3 lb.	Carbaryl (Sevin) 5%	No time limitations.*
	European corn borer	Carbaryl (Sevin) 50% WP 3 lb.	Carbaryl (Sevin) 5%	No time limitations.* Apply to foliage when egg clusters appear.
		DDT 50% WP 2 lb.	DDT 5%	
	Tuberworm	DDT 50% WP 3 lb.		Spray foliage 2 or 3 times. Store potatoes in burlap bags previ- ously soaked in 1% DDT.
	Wireworms	Diazinon 50% WP 4-8 lb. add sufficient water for good coverage	Diazinon 14% Granular 15-25 lb.	Treat plowed soil then harrow or disc into top 4-8 inches just prior to planting.
			Diazinon 14% Granular 8-15 lb.	Apply to depth of 3-6 inches along both sides of row at planting.

WP = Wettable Powder

EC = Emulsifiable Concentrate

\*Number of days established as the minimum time between last application and harvest when applied at the specified rate. Some of the safer insecticides are designated as "No Time Limitation." Insecticide dosages apply only to vegetables for human consumption and not when plants are used for forage.

## VEGETABLE INSECTS (continued)

Crop	To Control	Sprays (Amount per acre)	Dusts (25 to 30 Lb. per acre)	Remarks
Potatoes (cont'd.)	Wireworms (continued)	Chlordane 4 to 6 lb. active ingredient per acre.	Dust or spray or granular	Treat plowed soil then narrow or disc after applying. Do not treat soil more than once each three years.
Pumpkins				See cucumbers
Radish	Flea beetle	Rotenone 5% 5 lb. DDT 50% WP 3 lb.	Rotenone 1% DDT 5%	1 day* No time limitation*
Spinach	Aphids	Naled (Dibrom) 60% EC 1 qt. Malathion 25% WP 6 lb.	Naled (Dibrom) 4% (apply 50 lb.) Malathion 5%	4-days* 7 days*
Squash				See cucumbers
Sweet Potatoes	Foliage insects	Many species of sucking and chewing insects feed upon the foliage of sweet potatoes. These usually do not appear to affect yields.		
	Wireworms		Diazinon 14% Granular	Broadcast 21 lb. per acre over top of foliage when roots begin to form. This is usually during the latter part of July.
Tomatoes	Aphids	Malathion 25% WP 6 lb. Endosulfan (Thiodan) 50% WP 1 lb.	Malathion 5% Endosulfan (Thiodan) 3%	1 day* 1 day*
	Tomato fruitworm	DDT 50% WP 4 lb.	DDT 10%	5 days*
	Hornworm	Carbaryl (Sevin) 50% WP 3 lb.	Carbaryl (Sevin) 5%	No time limitations.*
	Flea beetle	TDE 50% WP 4 lb.	TDE 10%	Do not apply immedi- ately prior to harvest.
	Leaf miners	Diazinon 50% WP 1 lb.		1 day*
		Malathion 25% WP 6 lb.	Malathion 5%	1 day*
		Dimethoate 2.67 E ¾-1 pt.		7 days*
	Stink bugs	Mevinphos (Phosdrin) 25.4% EC 1 qt. Carbaryl (Sevin) 50% WP 3 lb. Guthion 25% WP 2 lb.	Mevinphos (Phosdrin) 2% (20-25 lb./A.) Carbaryl (Sevin) 5% Guthion 3% (Apply 15-20 lb. per acre)	1 day*. CAUTION: Do not use in the home garden. No time limitations.* No time limitations.*
	Spider mites	Kelthane 18.5% WP 3 lb.		2 days.* Spray leaves thoroughly, especially undersides.
	Aphids, Mites, Flea Beetles	Transplant Seed Beds Apply disyston granules 10% over the bed at a rate of 30 lb./a. Work into the top 2 to 3 inches of soil. Then seed in the nor- mal manner. OR Broadcast Disyston Granules 10%, evenly over the plants after emergence, at a rate of 30 lb./a. Water thoroughly immediately. Apply either of the above treatments once per season.		

### Tomatoes—Trellised

Use the above tomato insecticides at recommended rates in 200 gallons of finished spray. Do not use more than 200 gallons per acre.

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Insecticide dosages apply only to vegetables for human consumption and not when plants are used for forage.

## VEGETABLE INSECTS (Continued)

Crop	To Control	Sprays (Amount per acre)	Dusts (25 to 30 Lb. per acre)	Remarks
Turnip Greens				See Leaf Crops
Turnips				See Cabbage
Watermelons				See Cucumbers
General (Refer to crop concerned for residue tolerance)	Cutworms		Baits. See grasshoppers	Scatter bait late in the evening. Use 15 to 20 lbs. per acre.
		Toxaphene, 2 lb. active ingredient per acre.	Toxaphene, 10% 20 lb./a.	Dust or spray prepared soil several days before setting plants.
		DDT, 2 lb. active ingredient per acre	DDT, 5% 40 lb./a.	
		Chlordane, 1½ lb. active ingredient per acre.	Chlordane, 5% 30 lb./a.	
		Diazinon 2 lb. active ingredient per acre	Diazinon 2% 100 lb./a.	
		Sevin	Follow label directions	
		Guthion	Follow label directions	
	Grasshoppers	Dieldrin, 3 oz. active ingredient per acre	Dieldrin, 1½%	Apply dusts at the rate of 10-12 lbs. per acre. Treat fence rows and grassy areas surrounding crop land, especially when nymphs first appear in the spring. Do not apply to crops. Do not graze animals on treated areas.
		Aldrin, 4 oz. active ingredient per acre.	Aldrin, 2½%	
		Heptachlor, 4 oz. active ingredient per acre.	Heptachlor, 2½%	
Toxaphene, 2 lb. active ingredient per acre.		Toxaphene, 20%		
Chlordane, 1½ lb. active ingredient per acre.				
BAITS. 25 lb. mill run bran, 75 lb. sawdust and 2½ oz. aldrin or 1½ lb. toxaphene or ¾ lb. chlordane. Add 10 to 12 gallons of water.			Scatter bait early in the morning. Use 10 to 15 lb. per acre (dry weight).	
Mole crickets	100 lb. dry wheat bran, 8 lb. sodium fluosilicate or 50% wettable chlordane. Add 3 to 5 gallons of water.		Scatter bait in late afternoon. Use 20 lb. per acre.	
Seed corn maggot	Add 1 oz. of 25% wettable aldrin or 25% wettable dieldrin or 25% wettable lindane to 1 bushel of seed.		Mix directly in the seed or in combination with fungicide as a slurry treatment. Do not use treated seed for food purposes.	
Slugs	Use metaldehyde bait. Do not contaminate edible parts.			
Vegetable weevil	See Cabbage.			
Webworm	Toxaphene 40% WP 6 lb.	Toxaphene, 10%	Refer to crop infested for residue tolerance.	
	DDT 50% WP 2 lb.	DDT, 5%		
	Rotenone 5% 5 lb.	Rotenone, 1%		
White-fringed beetle	Broadcast method. 5 lb. chlordane or 2 lb. aldrin or 1½ lb. dieldrin, or 10 lb. DDT active ingredient per acre.		Apply in dusts, sprays, or granular formulations. Broadcast on soil and immediately work into top 3 inches.	

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\* Number of days established as the minimum time between last application and harvest when applied at the specified rate. Some of the safer insecticides are designated as "No Time Limitations." Insecticide dosages apply only to vegetables for human consumption and not when plants are used for forage.

## For Better Control of Vegetable Insects

The aim of a grower is to produce a quality crop, free from insect contamination. This is accomplished by combining good judgment with good control practices. Sometimes pests appear suddenly in great numbers and destroy young plants within a few hours, or they may lay many eggs and leave the final destruction to their offspring. Numbers are not always necessary; a single cutworm may destroy a plant or a cucumber beetle devour a seedling without help.

Usually many kinds of insect pests attack a crop and these may appear at different times; therefore, a close watch is important and proper insecticides must be ready for use. Re-treatment with insecticides is sometimes necessary. Check the number of days established by the Food and Drug Administration for limiting insecticide application prior to harvest. Handle all insecticides with care and follow prescribed formulations, rate of application, and other suggested procedures. Further information may be obtained from your County Agent or from Extension Circular No. 313 (Rev.) "Vegetable Insects of North Carolina."

**RESISTANT VARIETIES** of vegetables may help increase the effectiveness of control measures. This does not mean these varieties are immune to insect attack, but rather that they may be less heavily infested or may suffer less damage from insect invasion than certain other varieties. Experiments on some resistant vegetable varieties have shown that insecticide control was more effective and thus more economical than on susceptible varieties. Plants are better able to tolerate insects when grown under good cultural practices and supplied with adequate water and fertilizer.

Many varieties of vegetables are under observation in North Carolina to determine their relative resistance to destructive pests. Some of these are listed for the information of growers who may wish further knowledge in selecting varieties. It is possible that a vegetable variety susceptible to insect attack may

be chosen over one resistant to attack because it produces higher yields, or packs and ships better, or has other more desirable characteristics, but insect resistance can be a great advantage if the variety is otherwise acceptable.

### Sweet Corn

In the Coastal Plains the optimum period for worm free ear development is usually from July 10 to July 20. The combination effects of late season and increasing insect damage after the middle of July complicates the insect control and production program in sweet corn.

**Resistance to corn earworm:** This has been studied for many years in different parts of the United States. Some variation appears to exist in different areas and in different times of the season. In North Carolina the most resistant varieties tested were Victory Golden, Gold Pack and Golden Security. Varieties that were more susceptible were Spangcross, Ioana, Aristigold Bantam Evergreen, and Carmelcross.

Many other varieties included in the tests were considered as intermediate in their resistance. The order in which varieties are listed has no significance and this listing may be changed with further research.

**Resistance to sap beetles:** At times these small, dark-colored beetles are very destructive and are not easily controlled with insecticides. The more resistant sweet corn varieties tested were Golden Regent, Golden Tighthusk and Triplegold. The more susceptible ones were Ioana, Spangcross and Golden Cross.

**Resistance to fall armyworm:** Corn harvested after the latter part of July may be heavily infested by this insect. Therefore, late planting in itself is less desirable than early spring planting from the standpoint of insect control. The varieties more resistant to fall armyworm were Golden Regent, Goldenyield, Golden Tighthusk, Golden Security and Golden Sensation. The more susceptible varieties were Carmelcross, Ioana, Spangcross and Golden Cross Bantam.



Golden Security sweet corn—Resistant to fall armyworm

Ioana sweet corn—Susceptible to fall armyworm

Left "Resistant" to corn earworm  
Right—"Susceptible" to corn earworm

**Resistance to Japanese beetles:** The silks of Goldenyield have been found to be very attractive to Japanese Beetles. This may be true of some other varieties. When these insects are abundant they can affect pollination seriously unless they are controlled with DDT.

### Snap Beans

**Resistance to Mexican bean beetle:** The more resistant varieties tested were Wade, Logan and Black Valentine. The more susceptible varieties were State, Bountiful and Dwarf Horticultural.

### Potatoes

**Resistance to potato leafhopper:** Delus has shown high resistance. Sebago, Pungo, and Plymouth were less resistant. Cobbler was very susceptible.

**Resistance to Colorado potato beetle:** Katahdin has shown resistance to Colorado potato beetle. Fundy, Plymouth, and Catoosa were susceptible.

### Sweet Potatoes

**Resistance to wireworms:** Nugget and All Gold were more resistant to southern potato wireworm than Porto Rico, Centennial, Georgia Red, or Gold Rush.

**Resistance to flea beetles:** Centennial and All Gold showed very little sweet potato flea beetle injury, Nugget and Gem were susceptible.

### Tomatoes

**Resistance to two-spotted spider mite:** Campbell 135 was highly resistant to an infestation which damaged Homestead 24 severely. Campbell 146 was intermediate.

### Squash

**Resistance to pickleworm:** Differences were very distinct between the more resistant and the more susceptible varie-

ties. The more resistant varieties tested were Butternut 23, Summer Crookneck, Early Prolific Straightneck and Early Yellow Summer Crookneck. The more susceptible varieties were Cozini, Black Zucchini, Caserta, Zucchini, Short Cocozelle and Benning Green Tip Scallop.

**Resistance to striped cucumber beetles:** Only slight differences appeared except that Black Beauty, Cozini and Caserta were more susceptible than other varieties tested. Squash is especially vulnerable to the attacks of this beetle when plants are in seedling stage.

### Cucumbers and Watermelons

Germinating cucumber plants of the variety Nappa 63, were resistant to spotted cucumber beetles, other varieties and all watermelon varieties tested were susceptible.

### Cabbage, Broccoli, Collards, Kale and Rutibaga (Crucifers)

**Resistance to cabbage caterpillars:** Red and savoy cabbage varieties have generally shown greater attractiveness to the imported cabbage-worm butterfly and cabbage looper moth for egg deposition than most of the green cabbage varieties. However, the larvae or caterpillars usually developed more rapidly in the green varieties and damage was more evident. Therefore, the red and savoy varieties were considered as more resistant to caterpillars than the green varieties. The most susceptible variety tested was Copenhagen Market 86; otherwise, the differences between green varieties were indistinct and difficult to measure.

Harris Resistant Danish was the most resistant variety of cabbage to diamond-back caterpillars, and Early Jersey was the most susceptible in comparisons made at our research farm in Faison, N. C.

Varieties of broccoli were somewhat more susceptible than cabbage. Collards, rutabaga and turnips were comparable in their degree of infestation and were less resistant than broccoli. There was considerable range between varieties of kale. The most resistant variety (Vates) was as resistant as cabbage. Dwarf Siberian was the most susceptible of all crucifers studied.

Resistance to striped flea beetle: In general, varieties of radishes, turnips, rutabaga, and mustard were very heavily infested and severely damaged, while cauliflower, cabbage, brussels sprouts, broccoli, and kale had varying degrees of resistance. Green Glaze collards were very susceptible. Other varieties of collards tested were resistant.

	Page
Aphids .....	4, 5, 7, 9, 11, 12
Beans .....	3, 15
Bean leaf beetle .....	2, 3
Beets .....	3
Blister beetle .....	10, 11
Broccoli .....	5, 15
Cabbage .....	5, 15
Cabbage caterpillars .....	5, 9, 15
Cabbage maggot .....	2, 5
Cantaloupe .....	7
Caterpillars .....	5, 9
Collards .....	7, 9
Colorado potato beetle .....	8, 11, 15
Corn .....	7, 9, 14
Corn earworm .....	3, 6, 7, 9, 14
Cowpea curculio .....	8, 11
Cucumbers .....	7, 15
Cucumber beetles .....	6, 7, 15
Cutworms .....	10, 13
Eggplant .....	9
European corn borer .....	8, 11
Fall armyworm .....	9, 14
Flea beetle .....	5, 6, 9, 11, 12, 15
Foliage Insects .....	12
Grasshoppers .....	13
Harlequin bug .....	4, 5
Japanese beetle .....	15
Hornworm .....	12
Lace bugs .....	6
Leafhoppers .....	3, 8, 11, 15
Leaf miners .....	5, 12
Lettuce .....	9

	Page
Mexican bean beetle .....	3, 15
Melonworm .....	7
Male cricket .....	10, 13
Mustard .....	9
Okra .....	9
Onions .....	9
Onion maggot .....	9
Peas .....	11
Peppers .....	11
Pickleworm .....	4, 7, 15
Potatoes .....	11, 12, 15
Potato tuberworm .....	11
Radish .....	12
Sap beetle .....	9, 14
Seed corn maggot .....	10, 13
Spider mites .....	2, 3, 9, 12, 15
Spinach .....	12
Spotted cucumber beetle .....	3, 6, 7, 15
Striped cucumber beetle .....	6, 7, 15
Squash .....	7, 12, 15
Squash bug .....	4, 7
Squash vine borer .....	4, 7
Tomatoes .....	12, 15
Tomato fruitworm .....	12
Thrips .....	9
Turnips .....	9, 13
Vegetable weevil .....	4, 5, 13
Watermelons .....	13, 15
Webworm .....	13
Whitefringed beetle .....	10, 13
White grubs .....	8
Wireworms .....	8, 11, 12

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