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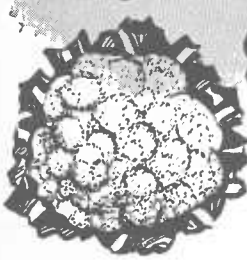
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Cabbage Insects

How To CONTROL THEM
in the HOME GARDEN



Cabbage
Broccoli
Cauliflower
Kale
Brussels sprouts
Collards
Kohlrabi

Home and Garden Bulletin No. 44
U. S. DEPARTMENT OF AGRICULTURE

Insects reduce yield and quality of cabbage in home gardens throughout the country. Some feed on stalks and roots, and some on the leaves; others suck juice from the plants.

The insects that attack cabbage also attack related plants—broccoli, cauliflower, kale, brussels sprouts, collards, and kohlrabi.

Use of the right insecticide at the right time will prevent damage to cabbage and related plants, but no one insecticide will control all the insects.

The chart shows what insecticide to use, how to prepare it, and how to apply it. Other control measures are suggested on the back page.

Kinds of cabbage insects most commonly found

1. Those that feed on stalks and roots

Soil-inhabiting cutworms are dull gray, brown, or nearly black caterpillars. Some are spotted, others striped. They hide in the soil during the day and come out at night to feed. They often cut off cabbage stalks near the soil surface.

Mole crickets are light velvety brown to blackish. They resemble field crickets slightly. They have short, stout forelegs and shovellike feet. Their burrowing uproots seedlings and causes soil to dry out quickly.

Root maggots are legless, yellowish-white larvae of flies. They tunnel stems and roots. The cabbage maggot is the species most destructive to cabbage.

● General suggestions on use of insecticides

If as much as 1/2 inch of rain falls within 24 hours after an insecticide is applied, repeat the application.

If the insecticide is applied directly to the plants, be sure that all parts of the plants get a light, uniform coating.

Dust when plants are moist and the air is still—usually in early morning or late afternoon.

Don't try to spray when a strong wind is blowing.

Avoid unnecessarily heavy dosages.

Sprays applied to the plants should contain a small quantity of neutral soap or a proprietary wetting agent.



CONTROL with INSECTICIDES • • • Use This Chart To Select an Insecticide That Will Control the Cabbage Insects in Your Garden

INSECTICIDE

AMOUNT AND PREPARATION

APPLICATION

SOIL-INHABITING CUTWORMS

DUST:	10-percent toxaphene.....	$\frac{3}{4}$ pound per 1,000 square feet.	Apply to soil before planting if cutworms are present. . . . After planting, apply to soil around and between plants. See Precautions.
SPRAYS:	40-percent toxaphene wettable powder.....	6 level tablespoonfuls in 2 gallons of water for each 1,000 square feet.	
	60-percent toxaphene emulsifiable concentrate.....	2 tablespoonfuls in 2 gallons of water for each 1,000 square feet.	
BAIT:	Ready-mixed bait containing 3 percent of toxaphene.	1 pound per 1,000 square feet (40 pounds per acre).	Spread by hand on the soil—not on the plants—in late afternoon.

MOLE CRICKETS

DUST:	5-percent chlordane.....	2 pounds per 1,000 square feet.	Mix dust or spray thoroughly into upper 6 to 8 inches of soil 1 week or more before planting. . . . If mole cricket damage occurs after planting, apply chlordane dust to soil only around and between plants. See Precautions.
SPRAYS:	40- to 50-percent chlordane wettable powder.....	$\frac{3}{4}$ cupful in $2\frac{1}{2}$ gallons of water for each 1,000 square feet.	
	45-percent chlordane emulsifiable concentrate.....	6 tablespoonfuls in $2\frac{1}{2}$ gallons of water per 1,000 square feet.	

ROOT MAGGOTS

40- to 50-percent chlordane wettable powder in transplanting water.	$2\frac{1}{2}$ level tablespoonfuls in each 4 gallons of water.	Use $\frac{3}{4}$ cupful of water where each plant is set.	
45-percent chlordane emulsifiable concentrate in transplanting water.	1 tablespoonful in each 4 gallons of water.		
DUST:	5-percent chlordane.....	2 ounces for each 50 feet of row (40 pounds per acre).	In the plant bed, apply when first 2 leaves appear. In the garden, apply shortly after planting time. Concentrate the application at the base of the stalk. See Precautions.
SPRAYS:	40- to 50-percent chlordane wettable powder.....	$1\frac{1}{2}$ level tablespoonfuls in 1 gallon of water for each 200 feet of row.	
	45-percent chlordane emulsifiable concentrate.....	1 tablespoonful in 1 gallon of water for each 200 feet of row.	

CATERPILLARS AND OTHER LEAF FEEDERS

DUST:	10-percent toxaphene.....	$1\frac{1}{2}$ ounces for each 50 feet of row.	BEFORE the edible part of the plant appears: Apply one of these dusts or sprays as soon as the insects appear. Repeat applications every 7 to 10 days, if needed, until plants begin heading. . . . Start web-worm control on late-summer and fall plantings as soon as the first true, or crinkly, leaves appear. See Precautions.
SPRAYS:	40-percent toxaphene wettable powder.....	3 level tablespoonfuls in 1 gallon of water for each 200 feet of row.	
	60-percent toxaphene emulsifiable concentrate.....	1 tablespoonful in 1 gallon of water for each 200 feet of row.	
DUST:	4-percent malathion or 4-percent naled.....	$1\frac{1}{2}$ ounces for each 50 feet of row.	AFTER the edible part of the plant appears: Apply one of these dusts or sprays if needed. Repeat weekly as long as needed. Do not apply malathion to broccoli within 3 days before harvest, or to other cole crops within 7 days before harvest. Do not apply naled within 4 days before harvest. See Precautions.
SPRAYS:	50- to 57-percent malathion emulsifiable concentrate.	2 teaspoonfuls in 1 gallon of water for each 200 feet of row.	
	8 pounds-per-gallon naled emulsifiable concentrate.	$1\frac{1}{2}$ teaspoonfuls in 1 gallon of water for each 200 feet of row.	

HARLEQUIN BUGS AND STINK BUGS

DUST:	4-percent Carbaryl (Sevin) or 4-percent naled.....	1 to $1\frac{1}{2}$ ounces for each 50 feet of row.	Apply when insects first appear. Do not apply carbaryl to collards or kale within 14 days or to other cole crops within 3 days before harvest. Do not apply naled within 4 days before harvest. See Precautions.
SPRAYS:	50-percent Carbaryl wettable powder.....	3 level tablespoonfuls in 1 gallon of water for each 200 feet of row.	
	8 pounds-per-gallon naled emulsifiable concentrate.	$1\frac{1}{2}$ teaspoonfuls in 1 gallon of water for each 200 feet of row.	

APHIDS

DUST:	4-percent malathion (see Precautions).....	$1\frac{1}{2}$ ounces for each 50 feet of row.	Make the first application as soon as the aphids appear. Repeat weekly until they are no longer present. . . . Do not apply malathion to broccoli within 3 days before harvest or to other cole crops within 7 days before harvest. Do not apply naled within 4 days before harvest. See Precautions.
SPRAYS:	50- to 57-percent malathion emulsifiable concentrate (see Precautions).	2 teaspoonfuls in 1 gallon of water for each 200 feet of row.	
	8 pounds-per-gallon naled emulsifiable concentrate.	$1\frac{1}{2}$ teaspoonfuls in 1 gallon of water for each 200 feet of row.	



The cabbage looper. About 2 times natural size.

2. Those that feed chiefly on leaves

CATERPILLARS

Imported cabbageworms, also known as common cabbageworms, are velvety green. They have an orange stripe down the middle of the back and a yellow stripe along each side.

Cabbage loopers, often called measuring worms, are pale green. They have several light, lengthwise stripes. They crawl by doubling up, or forming a "loop," then projecting the front part of the body forward.

Diamondback moth caterpillars are pale green, and are pointed at each end.

Climbing cutworms look much like soil-inhabiting cutworms.

Cabbage webworms are grayish yellow, and have five brownish-purple lengthwise stripes. Their heads are black and have a V-shaped marking. They often destroy the buds of young plants, especially in the South during late summer and fall.

Cross-striped cabbageworms have tiny black stripes across bluish-gray backs, with a black stripe and a yellow stripe along each side. The underside is light green, mottled with yellow. These caterpillars prefer the buds and heads of cabbage plants.



Larva of the diamondback moth.
About 6 times natural size.



The harlequin bug. About
4 times natural size.



Left: The cabbage webworm. About 4 times natural size. Right: Appearance of crinkly leaves is signal to start webworm control (see chart).

Southern cabbageworms are bluish or purplish green. They are marked with four yellow stripes lengthwise on the body and with small black dots. They cause serious damage in Arizona, and sometimes in other regions.

OTHER LEAF FEEDERS

Other leaf-feeding cabbage insects include flea beetles, cucumber beetles, grasshoppers, and the vegetable weevil.

3. Those that suck juice from the plants

Aphids, or plant lice, are soft-bodied insects. The cabbage aphid is green to powdery blue, and is covered with a whitish wax. The turnip aphid is green, or green and black. The feeding of aphids distorts leaves and causes them to curl downward; it may stunt the plants and make them unfit for use.

Harlequin bugs are shield-like in shape, black, and about $\frac{3}{8}$ inch long. They are marked with red and yellow. Their feeding causes plants to wilt and turn brown.

Stink bugs are like harlequin bugs in shape and size, but they are green or brown. They damage plants in the same way that harlequin bugs do.



A cabbage plant beginning to head. Leaves that develop later will be on the harvested product.

Applicators

In small gardens, use a plunger-type hand duster or a bellows duster for dusting plants, and a hand atomizer or compressed-air sprayer for spraying. In hand atomizers, use only all-liquid insecticides. In large gardens, use a hand-operated crank duster, or a knapsack sprayer.

Hand atomizers and compressed-air sprayers are not equipped with an agitator. Shake the container frequently to keep the insecticide well mixed. Be sure that the pressure is exhausted from compressed-air sprayers before opening the lid.

Precautions

Insecticides used improperly can be injurious to man and animals. Use them only when needed and handle them with care. *Follow the directions and heed all precautions on the labels.*

Toxaphene and chlordane can be absorbed through the skin in harmful quantities. Avoid spilling them on your skin and keep them out of your eyes, nose, and mouth.

If you spill any on your skin, wash it off immediately with soap and water. If you spill any on your clothing, remove the clothing immediately and wash the skin thoroughly. Launder the clothing before wearing it again.

Do not apply toxaphene or chlordane to leafy vegetables after the appearance of plant parts to be eaten.

Do not apply naled to kohlrabi, and do not apply carbaryl to collards or kale.

Other control measures

Transplant spring crops as early as possible. Space the plants uniformly along the row and far enough apart to allow insecticides to reach all parts of the plants.

Apply an insecticide before transplanting infested plants or thinning an infested planting.

Harvest the cabbage, cauliflower, and kohlrabi plants as soon as they are ready for use; destroy plants that are not to be used. . . . Get rid of weeds in and around the garden; they harbor insects. . . . Keep your garden well fertilized, well irrigated, and as disease free as possible.

You can protect transplants from soil-inhabiting cutworms by placing a stiff cardboard "collar," 3 inches high, around each plant. Put it 1/2 inch away from the stalk as soon as plants are set out. Push it 1 inch into the soil.

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