

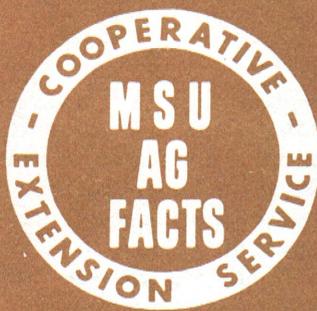
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Control of field Corn Insects  
Michigan State University  
Cooperative Extension Service  
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# CONTROL OF FIELD CORN INSECTS

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EVERY STAGE OF THE CORN CROP in Michigan, from the time seed is planted through storage of the harvested grain, can be attacked by one or more species of insect pests. These insects are seldom damaging to a large acreage every year, however. They damage some fields each year, and some of them appear in large numbers (outbreaks) during some years.

Check your fields of corn periodically for the pests in order to anticipate possible damage and apply controls in time to prevent losses in yields.

Some suggestions on when and what to look for while checking fields for insects are summarized in Table 1. Note that fields should be checked even before planting. Walk or drive through the fields and look for the problems noted in Table 1.

The damage of cutworms and armyworms can occur very rapidly. The timing of insecticides for European corn borer control is also extremely important. Be especially careful in checking for these insects. Many of the insects that damage corn build up in wet, weedy areas in adjacent fields or in the corn field itself. Check these areas very carefully. Insecticides recommended for the control of the pest are summarized in Table 2.

## White Grubs and Wireworms

Adults of the white grubs (called May beetles or June bugs) and adults of the wireworms (called click beetles) usually lay their eggs in grassy fields, sod, old pasture and weeds. The larvae that hatch from these eggs feed on the roots of grasses, corn and other crops that may be planted later in these fields. The larvae can persist and cause damage for two years after the sod has been plowed.

White grubs have white, thick, soft, cylindrical bodies and curl into a C-shape when disturbed. They have a definite head, six small legs just behind the head, and range up to 1 1/2 inches in length.

Wireworms have tan, hard, thin, cylindrical bodies. They also have a definite head and six small legs just behind the head.

Look for white grubs and wireworms in the plow furrows while fitting the land and apply an insecticide if they are easily found. Check the roots of wilting seedling plants for feeding and the soil around such plants for the grubs or worms.

If there is time, these affected areas and the margin around them may be disked, an insecticide applied and the area replanted.

Apply the insecticide as a spray or granule to cover the soil surface. Work it into the upper layer of soil immediately. Applying the insecticide just before the final disking of the soil is a good practice.

## Seedcorn Maggot

The seedcorn maggot is a whitish, spindle-shaped larva that lacks both a definite head and legs. The maggots tunnel into the seed and the stems of the seedlings. Their damage appears as areas of poor stand or as weak, wilting seedlings.

The adults of the maggot are small flies. They lay their eggs in soils high in organic matter (muck soils or fields with a lot of weed, stubble or manure plowed down). Maggots hatching from these eggs damage the corn. Late planted corn is especially susceptible to seed corn maggot.

Start looking for areas of poor stand as soon as the corn begins to germinate. Check the seed and stems of the seedlings for the maggots.

Treatment of the seed with an insecticide is recommended for control of the seed corn maggot. Seed treatment is best done by the seed dealer at the same time the seed is treated with fungicide. Seed treatment formulations of the insecticide are available for use in planting box applications if ready-treated seed is not available. Follow the instructions on the label of the seed treatment to be sure to get even coating on the seed.

## Corn Rootworms

There are two species of corn rootworms that damage corn in Michigan. Their damage and larvae are very similar, but the adults can be easily differentiated.

1. *The northern corn rootworm adult* is a uniform pale yellow or green. This species feeds exclusively on corn and is currently the principal rootworm in corn in Michigan.

2. *The western corn rootworm adult* is yellow with black markings on each wing. These markings are generally a black stripe on each wing and another black stripe down the center of the wings, but the markings

vary from small spots at the base of the wing to having the entire wing black. The western, too, feeds only on corn. The western corn rootworm has been moving eastward across the corn belt for the last 20 years. It was first found in Michigan in 1971 and is now spread widely over the lower peninsula. It causes even more damage to corn than the northern corn rootworm and is a potentially serious threat to Michigan.

Both species of corn rootworm adults are hard-shelled beetles with long antennae. The adults feed on the silks and tassels of corn during late July to September and are very active. When adults are abundant, their trimming of the silks causes poor seed set.

The adult northern and western corn rootworms lay their eggs in late summer only in the soil of corn fields. These eggs overwinter and hatch in late May to mid-June of the following season. Larvae that hatch from these eggs are slender and cylindrical with whitish bodies that range to nearly 1/2 inch in length. The larvae have a tan head, six small legs just behind the head and no false legs on the abdomen. They feed only on corn, tunneling through roots and pruning small roots of corn. Their damage to the roots causes stunting and early wilting of the plants during periods of drought in June and July. Plants that show stunting or wilting should be examined for the feeding of the larvae. The weakened roots will not support the plants, and infested fields become lodged and difficult or impossible to harvest. The lodging is from the soil level, and plants injured by rootworms are commonly curved (goose-necked) from their bases. The larvae form immobile pupae in the soil when they have completed their larval development. Adults emerge from these pupae in mid-July and August.

### Control Measures

The best control for corn rootworm is to rotate corn with any other crop when this is economically feasible. The rootworm larvae that hatch from the eggs cannot exist on the other crop. Adult rootworms will not lay eggs in the alternate crop. Corn planted in the field following the alternate crop will, therefore, be free of rootworms. The need to have corn-after-corn should be critically reviewed by the grower if rootworm problems appear. Fields should be rotated unless absolutely necessary to plant corn-after-corn.

Not every field of continuous corn will have problems with rootworms. Many fields in Michigan have been in corn numerous years without any rootworm damage. Check your fields carefully before deciding to invest in equipment and insecticides for rootworm control. Rootworms persist as pests in fields of constant corn; once a grower has had rootworm damage in an unrotated field, he can expect continuing damage from the rootworm.

1. Plants that show stunting, wilting, or lodging in June should be examined for the rootworm larvae and their damage to the roots. If larvae are found in time, a cultivation application may be made, as described below, to protect the field from further injury.

2. The tassels and silks of plants should be checked for adults of the rootworm when plants are tasseling. As

a general rule, one adult per plant means a rootworm problem in corn planted in that same field the next season. If the rootworm adults are abundant (about two or more per ear) and the seed has not set, a spray for control of the adults is needed. Insecticides recommended for adult control are given in Table 2.

3. Lodged, mature corn should be checked for tunneling of the larvae of the rootworms. Root rots always accompany the rootworm, and the smaller roots are often completely rotted off. The tunnels can usually be found in the brace roots, however, even when the rest of the root system is nearly completely gone.

### Plan Ahead

Once you are convinced that insecticides are necessary, plan ahead of planting time to obtain the needed equipment and insecticides.

*Pre-plant broadcast applications* of insecticides are made by spraying or applying granular insecticides to the soil surface of the entire field. Applying the insecticides immediately before finally disking is a good practice.

*Planting band applications* are made by spraying or applying granular insecticides in a 7-inch band over the row. Apply the insecticides above and out of contact with the seed. Place the spray nozzle or a granular applicator spout between the seed spout and the covering wheel. It may be necessary to modify the covering wheel so that it will incorporate the insecticide into the upper surface of the soil. If more convenient, apply insecticides in bands over the row and incorporate them into the soil after planting, before the plants emerge.

*Cultivation band applications* are made by spraying or applying granular insecticides in about 3-to 4-inch bands on both sides of rows of growing corn and incorporating the insecticide into the upper surface of the soil with a cultivator shoe. This application takes especially modified equipment, but is the only practical means of applying insecticides to growing corn for rootworm control. It is especially recommended if the rootworm infestation is not found until after the corn germinates.

### Cutworms and Armyworms

Both cutworms and armyworms are cylindrical with a definite head, three pairs of jointed legs just behind the head and five pairs of fleshy legs near their rear ends. The cutworms are variable in color, but generally dark. Cutworms cut the plants at night and hide in the soil surface near the plants during the day. Check fields every few days following germination for plants that are cut at their bases. Search the soil around the cut plants for the cutworms and apply an insecticide if they are common in the field. If not controlled, the large cutworms can destroy a stand very quickly. Do not delay applying an insecticide if it is needed. Apply insecticides either as sprays or granules in a band just wide enough to cover the plants.

Armyworm ranges in color from tan to nearly black, usually with a broad, pale stripe down each side. The larvae overwinter in the soil or plant debris. They pupate

early in the spring and emerge as adult miller moths. The adults lay their eggs in clusters on the leaves of grains or grasses and fold and seal the leaf over the eggs. They most frequently lay their eggs in dense grasses and heavy stands or lodged areas of grain (especially rye). Such areas in the field or in adjoining fields should be especially well checked for the presence of the worms. The larvae that hatch from the eggs feed at night on the leaves of the grasses and grains by chewing the margins of the leaves.

The armyworm feeds in the whorl of the corn as well as on the leaves. Their feeding in the whorl causes elongate holes in the leaves, and larval droppings (frass) can be seen in the whorl. The armyworms hide during the day in the soil and litter around the base of the plant. Their feeding and pellet-casting are easily seen, however, and a search in the area where these are common will soon disclose the worms. The worms will feed during the day and "march" in "armies" from field to field when they are abundant. It is this marching habit that has given them the common name of armyworm.

Insecticides for armyworm control can be applied either as sprays or as granules. Granular insecticides will penetrate into the whorl of the corn better than sprays. If sprays are used, a single large nozzle should be centered over the row of corn, and the spray applied at 40 or more gallons per acre.

#### **Billbug and Stalk Borer**

These two pests are usually most abundant in weedy areas of the field, or in margins along the sides of weedy fields. The billbugs are hard-shelled snout beetles. There are two types: one is large, black, and often found hiding in the soil near the plant; the other is smaller, gray, and usually found deep in the upper whorl of leaves of the plant. The larvae are small, white worms with a definite head but without legs. The larvae can tunnel through the stalk and feed on the roots in the soil. The damage done by the larvae is slight, but feeding by the adult in the whorl can kill the bud of the plant. The feeding of the billbug adults in the whorl causes rounded, parallel holes to appear on the leaves as the leaves unroll out of the whorl. Check fields for the feeding of the adults in the whorls of the corn. Apply an insecticide as a spray or granule if one-third or more of the plants show damage.

*The stalk borer* is a cylindrical worm with three pairs of jointed legs near its head and five pairs of fleshy legs near its tail end. It can be readily identified by the broad, dark, "saddle" marking across its middle. The larvae tunnel into the bases of the stalks and cause stunting or death of the plants. Their holes in the stems are marked by sawdust-like casting called frass. The borers are most damaging to small plants early in the season. Check fields of young corn for the larvae and their frassy holes. Apply an insecticide as spray or granule when about one-third or more of the plants show damage from this pest.

#### **Slugs, Flea Beetles, Grain Thrips**

These three distinctly different types of pests feed on the leaves of young corn. They are frequently most abundant in weedy areas of a field, but can spread over the whole field. Slugs are not insects. They are mollusks,

related to the clam, snail and octopus. They feed at night by chewing irregular holes through the leaves of the corn and hide during the day in the soil near the bases of the plants. The holes in the leaves and their slimy trails on the leaves are easily seen during the day. A search of the soil and debris near the plants will reveal soft, dark, slimy, rounded-to-elongate animals that range from 1/2 to 1 1/2 inches long. Slugs have been most abundant during cool, moist springs and are often damaging only in the wetter areas of the field. They can severely damage small plants when abundant. Thus, a spray should be applied to the area affected if their damage is seen on most plants.

*Flea beetles* are small, rounded, dark-colored, hard-shelled beetles that spring into the air when disturbed. The larvae of these beetles live on the roots of grains, grasses and some weeds. Flea beetles can be expected in corn fields that are weedy or close to grain fields. They are active insects, however, and may appear in any field. Flea beetles eat small, round, "shot-holes" completely through the young leaves of corn or feed on the upper surfaces of the leaves, causing a round, corky spot on the leaf. Their feeding retards the early growth of the plant and can kill small plants when beetles are numerous. In addition to the direct damage to corn, the flea beetles also carry the bacteria of Stewart's wilt disease of corn. Apply a spray to the area infested when most of the plants in the area show signs of feeding by the flea beetles.

*Grain thrips* are very small, ovoid, yellowish to reddish insects that scrape the upper surfaces of the leaves and suck up the juices. The thrips feed hidden in the leaf sheaths of the small plants. Their damage appears at first as silvery on the upper surface of the leaves. Heavily damaged leaves dry up, and the whole plant is stunted and retarded in growth when the thrips are abundant.

Thrips are usually found in grassy areas of the field (headlands for example), but can spread out and damage entire fields during dry weather. Apply a spray to small corn when most of the plants in an area show the silverying of the leaves caused by grain thrips.

#### **Grasshoppers, Cereal Leaf Beetle**

The well-known grasshoppers are normal residents of corn fields and rarely appear in large enough numbers to justify the use of insecticides for their control. The grasshopper most common in corn is the large, gray to green, differential grasshopper. They chew large areas out of the margins of corn leaves and are generally most abundant in the margins of the fields adjacent to weedy fields and fence rows. Check corn fields for grasshoppers and their leaf feeding during periods of drought. Give special attention to the margins of fields adjacent to large, weedy areas and apply an insecticide only if grasshoppers are especially abundant. Notify your county agricultural Extension agent if damaging numbers of grasshoppers are seen. Insecticides may be applied either as sprays or as granules.

*The cereal leaf beetle* is a severe pest of small grains, but the adults can damage young corn, especially when it is planted next to a heavily infested grain field. The adult cereal leaf beetle is a small, active, hard-shelled

beetle with blue wing covers and a red pronotum (neck). They emerge from the grain crops during mid-June to early July and may enter fields of corn grown next to the grains. Their feeding on corn appears as a whitish scratching on the leaf surface. The scratches fuse, and the leaf tatters and dries when the adults are numerous. Their feeding on corn is of importance only if the adults are abundant and the corn is still small. A spray of insecticides is needed only if their damage threatens to retard the growth of the small plants.

### **European Corn Borer**

The scale-like, rounded eggs of the European corn borer are laid in masses on the underside of corn leaves. The eggs overlap in the mass like shingles on a roof. They are whitish when first laid, but darken and form a definite black spot (the head of the larvae) just before hatching. The larvae make small white spots by feeding on the upper surface of the leaves soon after hatching. They move into the whorl within a day or so after hatching. Their presence in the whorl can be detected by the frassy droppings and parallel, elongate holes that appear in the leaves. Whorl damage looks the same as armyworm damage. The European corn borer larva has the same cylindrical shape as the armyworm and also has six small legs near the head and five pairs of fleshy legs near the tail. Larvae of the European corn borer, however, are whitish and usually marked with prominent dark brown or black spots.

Larvae of the borer leave the whorl after a few days and move to the stalks and even into the ear shanks of the corn. Their tunneling weakens the stalk, and damaged corn lodges, making harvesting very difficult. Stalks damaged by European corn borer break over at an upper internode, usually not at the base as they do when damaged by corn rootworms. Lodging is most severe, of course, when the stalk is broken below the ears. Larvae pupate within the stalk, and adults emerge from the pupae.

There are two generations of the borer per year in Michigan. Larvae overwinter in corn stubble and in an extremely wide range of other plants. They pupate early in the spring, and adult moths emerge to lay the eggs of the first generation in June. Adults are active only at night. They are attracted to light, and light traps are maintained in many areas to check the abundance of the moths. The adults of this first generation emerge and lay eggs of the second generation in August. It is the larvae of the second generation that pass the winter in an inactive state.

Be alert to notices from county agricultural Extension agents of the appearance of the adult European corn borer moths caught in the light traps. This will warn you when to check the fields. When you check the fields, also examine the undersides of the corn leaves for egg masses, check the upper surfaces of the leaves for white spots made by the small larvae, and examine the whorl for frass and larvae. An application of insecticides is needed when there is about one egg mass per plant or when 3/4 of the plants show damage of the larvae.

The European corn borer is easily controlled when the small larvae are exposed on the surface of the leaves, more difficult to control when the larvae are in the whorl, and cannot be controlled when the larvae are tunneling

in the stalk. The field must be checked frequently in order to time the applications to assure protection of the corn from the borer. The ideal time to spray is when the eggs are in the "black head" stage. They will hatch soon, and the small larvae will be entirely exposed to the spray. Granular insecticides or a spray applied as described for armyworm control are needed when the larvae are in the whorl. The corn will be tall when the second generation borer appears. An aerial application or a ground application with a "Hi-Boy" type of applicator will be needed.

### **Corn Leaf Aphid**

*The corn leaf aphid* is a small, inactive, green insect that sucks the juices of corn. It is found in colonies, most commonly in the tassels, leaf sheaths and bases of the ear. Its feeding can retard the growth of the plant and result in poor seed set on the ear. Aphids pump out a sticky liquid (honeydew). A mold forms on this honeydew and gives heavily infested plants a blackened appearance.

The corn leaf aphid is commonly found in all Michigan corn fields. Its natural enemies (lady beetles, lace wings, diseases and wasp-like parasites) usually keep their numbers below damaging levels. A spray is needed to control the corn leaf aphid only in fields where the seed has not been set, and nearly every plant shows appreciable blackened areas of honeydew in the tassels and axils of the leaves. Corn will be tall when the insecticide is applied. An aerial spray or a ground application using a "Hi-Boy" type of sprayer will be needed.

### **Corn Earworm and Sap Beetles**

These two insects attack the ears of corn. They are very seldom of any importance in field corn in Michigan.

*The corn earworm* is a cylindrical worm with a tan head, six small legs behind the head, and five pairs of fleshy legs near the tail. It ranges in color from pale green, reddish brown to nearly black. They have light stripes running the length of their bodies and range up to two inches in length.

Adult moths lay greenish, cone-shaped eggs singly on the silks of late-planted corn. The young larvae that hatch from these eggs feed on the silks and soft seeds near the tips of the ears. Check for eggs on the silks of field corn planted very late, and apply a spray to corn that has not yet set seed, if the eggs are found on most of the silks.

*Sap beetles* are hard-shelled black beetles that are spotted with yellow or red. They feed primarily on tissues that have been injured and are decomposing. They are frequently found in whorls of corn that have been damaged by armyworm or European corn borer and in the tips of ears damaged by birds or the corn earworm. When abundant they will feed on soft, sound kernels in the ear, but their damage is negligible. They are of special importance because they are found feeding on tissues that have been damaged by other causes and are frequently falsely accused of doing the damage. Their appearance in large numbers in a corn field is a good indication that the corn is in poor condition because of injuries from other insects, diseases or other causes.

**Table 1. Guide to Checking Corn Fields for Insect Pests.**

When to look	Where to look	What to look for	Insect
<b>Before planting</b>	Adjacent fields	Small grain, weedy, or grassy fields.	Expect armyworm, flea beetles, billbugs, cutworms, slugs, grasshoppers, grain thrips, cereal leaf beetle adults, and stalk borer.
	Corn fields	Wet or weedy places Previous sod or meadow in past 2 seasons Adults or lodging and damaged roots of corn last season. Muck soil, heavy weeds or stubble, heavy manure.	The insects above. Expect wireworms and white grubs. Expect corn rootworms. Expect seedcorn maggot.
<b>Land fitting</b>	Plow furrows	Thick-bodied larvae Slender, tough larvae	White grubs Wireworms
<b>Germination</b>	Area of poor stand	Roots pruned or seed gnawed Seed or seedling tunneled by legless larvae	Wireworms or white grubs Seedcorn maggot
		Plants cut at soil level; cylindrical larvae in soil	Cutworms
<b>Seedling and whorl stage</b>	Leaves	Irregular holes in leaves; soft, slimy animals in soil	Slugs
		Small round holes and corky spots; small black beetles on leaves	Flea beetle
		Silvering of upper leaf surface; small, active reddish to yellowish insects in bases of leaves.	Grain thrips
		White scratches on upper surface; blue beetles on leaves	Cereal leaf beetle adult
		Holes in leaves and frass in whorl: a. Hard shelled snout beetles in soil or whorl b. Striped cylindrical worms in whorls, leaves or soil c. Clear or spotted cylindrical worms in whorls or leaves	Billbug Armyworm European corn borer
Stalk near ground of wilting plants Roots of wilting of stunted plants	Frassy holes; cylindrical larvae with black middle; in stems or leaves	Stalk borer	
	Pruned, tunneled roots; small, white cylindrical larvae	Corn rootworm	
<b>Tasseled plants</b>	Leaves	Edges eaten; large, active insects Scale-like masses under leaves; cylindrical clear or spotted larvae	Grasshoppers European corn borer
		Leaf axils, tassel, base of ears Tassels, silks and ears	Black, sticky honey dew; small, soft green insects Yellow to green beetles with long antennae
	Lodged areas	Yellow beetles with black stripes and long antennae Black beetles with yellow or red spots Striped, cylindrical larvae Clear or spotted cylindrical larvae	Western corn rootworm adults Sap beetles Corn earworm European corn borer
		<b>Mature corn</b>	Stalks tunneled and broken above ground; spotted larvae in stalk near base Roots pruned and tunneled

**Table 2. Insecticides Recommended for Insect Control in Field Corn.**

Insect	Type application	Insecticide	Amount active insecticide	Limits <sup>a</sup>
<b>Seedcorn maggot</b>	Seed treatment	diazinon	2 oz/bu seed	Do not use seed for feed or food.
		dieldrin	1/2 oz/100 lb seed	Do not use seed for food or feed.
<b>Seedcorn maggot</b>	Soil, broadcast <sup>b</sup>	chlordane (Belt)	4 lb/A	<b>Non-dairy farms only;</b> apply before planting. Apply before planting. <b>Non-dairy farms only;</b> apply at planting. Apply at planting. Apply at planting.
		diazinon	4 lb/A	
	Soil, 7" band <sup>b</sup>	chlordane (Belt)	2 lb/A	
		Dasanit	1 lb/A	
		Dyfonate	1 lb/A	

**Table 2. Continued—Insecticides Recommended for Insect Control in Field Corn.**

Insect	Type application	Insecticide	Amount active insecticide	Limits <sup>a</sup>
<b>Wireworm</b>	Soil, broadcast <sup>b</sup>	diazinon	4 lb/A	Apply before planting.
		chlordane (Belt)	4 lb/A	Non-dairy farms only
	Soil, 7" band <sup>b</sup>	Dyfonate	4 lb/A	Apply before planting.
		chlordane (Belt)	2 lb/A	<b>Non-dairy farms only;</b> apply at planting.
		diazinon	2 lb/A	Apply at planting.
<b>White grub</b>	Soil, broadcast <sup>b</sup>	chlordane	4 lb/A	<b>Non-dairy farms only;</b> apply before planting.
		parathion	3 lb/A (mineral soils)	Apply before planting.
			4 lb/A (muck soils)	Apply before planting.
<b>Corn rootworm larvae</b>	Soil, broadcast <sup>b</sup>	BUX	4 lb/A	Apply before planting.
		chlordane (Belt)	4 lb/A	<b>Non-dairy farms only;</b> apply before planting.
	Soil, band <sup>b</sup>	BUX	1 lb/A	Apply at planting or post-emergence in June.
		Dasanit	1 lb/A	Apply at planting or post-emergence in June.
		Di-Syston	1 lb/A	Apply at planting or post-emergence in June.
		Furadan	3/4 lb/A	Apply at planting or post-emergence in June.
		Thimet	1 lb/A	Apply at planting or post-emergence in June.
		Dyfonate	1 lb/A	Apply at planting or post-emergence in June.
		prophos (Mocap, Jolt)	1 1/2 lb/A	Apply at planting or post-emergence in June.
		diazinon	1 lb/A	Apply at planting.
chlordane (Belt)	2 lb/A	Apply post-emergence in June.		
			<b>Non-dairy farms only.</b> Apply at planting.	
<b>Armyworm or cutworms</b>	Foliage application	Sevin	2 lb/A	0 days.
		diazinon	2 lb/A	10 days.
		Dylox	1 lb/A	0 days.
<b>Armyworm</b>	Foliage application	malathion	1 1/2 lb/A	5 days.
<b>Billbug, slugs, flea beetle, or stalk borer</b>	Foliage application	Sevin	1 lb/A	0 days.
<b>Grain thrips</b>	Foliage application	Sevin	1 lb/A	0 days.
		Di-Syston	1/2 lb/A	40 days; only 2 applications per year.
		Meta-Systox R	3/8 lb/A	7 days.
		malathion	1 lb/A	5 days.
<b>European corn borer</b>	Foliage application	Sevin	2 lb/A	0 days.
		diazinon	1 1/2 lb/A	12 days for forage; 0 days for grains.
		parathion	1/2 lb/A	12 days.
		Furadan	1 lb/A	Do <b>not</b> apply if Furadan at more than 1 lb/A had been applied to the soil; no more than 2 applications per year.
<b>Corn rootworm adults</b>	Foliage application	malathion	1 lb/A	5 days.
		ULV malathion	4 liq. oz./A	5 days.
		diazinon	1/2 lb/A	0 days.
		Sevin	1 lb/A	0 days.
<b>Corn earworm</b>	Foliage application	Sevin	2 lb/A	0 days.
		malathion	1 1/2 lb/A	5 days.
		parathion	1/2 lb/A	12 days.
<b>Cereal leaf beetle adults</b>	Foliage application	malathion	1 lb/A	5 days.
		ULV malathion	4 liq. oz./A	5 days.
<b>Grasshoppers</b>	Foliage application	malathion	1 lb/A	5 days.
		ULV malathion	8 liq. oz./A	5 days.
		diazinon	1/2 lb/A	10 days.
<b>Aphids</b>	Foliage application	diazinon	1 lb/A	10 days.
		Di-Syston	1/2 lb/A	40 days.
		Meta-Systox R	1/2 lb/A	7 days; 1 application per year.
		malathion	1 lb/A	5 days.
		Phosdrin	1/2 lb/A	1 day.

<sup>a</sup>The number of days refers to the time between application and harvest. Note that the use of chlordane is recommended for non-dairy farms only; the other insecticides can be used on dairy farms.

<sup>b</sup>Cover all soil-applied insecticide with soil as soon as possible after application. Spread "broadcast" applications to cover the entire soil surface. Apply "7-inch band" applications in a 7-inch wide band centered over the row. The amount of active insecticide cited for band application is for 40 inch row. The amount to be used when other row widths are used must be adjusted using the equation:

$$\text{adjusted amount} = \frac{40A}{W}$$

where A is the amount cited in the table and W is the row width, in inches, to be used. For example, if 1 lb/A is cited in the table and a 32 inch row width is to be used:

$$\text{adjusted amount} = \frac{40 \times 1}{32} = 1 \frac{1}{4} \text{ lb/A}$$

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