

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects.

- Reentry intervals are in hours unless indicated otherwise. For all reentry intervals of 0, do not enter the field without protective clothing until the spray has dried.
- *R* after the insecticide name indicates that the compound has a restricted-use label.
- “NA” under harvest restrictions indicates that the harvest interval is not applicable at the time the compound is being applied. However, the user should be aware that the harvest restrictions exist.
- *O* indicates that the pesticide is labeled for organic use. However, check with your organic certifier to be sure that the material is allowed for your organic system.
- For Certified Organic insect control materials, refer to the Organic Materials Review Institute materials list www.omri.org or call 514-343-7600 or check with your local certifier and see www.ams.usda.gov/nop.
- Pesticide use can many times be avoided by using a combination of pest management methods. See Part 1, Section 11, “Organic Crop Production,” and Part 2, Section 1, “Pest Management” to learn about IPM programs and methods for organic production.
- **Most of these products are highly toxic to bees and many other beneficial insect species. See labels for details.**
- Insurance treatments are not necessarily economical or effective parts of IPM programs.

Pest	Insecticide	Rate/A		Restrictions		Comments (read the label for dosage, method, and limitations)
		Formulated	Active	Harvest (days)	Reentry (hours)	
Armyworm Insurance Treatments	bifenthrin <i>R</i> (Brigade 2EC) (Discipline 2EC) <i>or</i>	0.15 to 0.30 oz per 1,000 ft of row	0.0023 to 0.0046 lb per 1,000 ft of row	30	12	Do not apply more than 0.3 lb ai per acre per season for all applications. Can also apply at a PRE or PPI application; see label for rates and information.
	bifenthrin <i>R</i> (Capture LFR) <i>or</i>	3.4 to 5.3 oz	0.04 to 0.062 lb		12	For mixing directly with liquid fertilizer to control soil insect pests. Can be preplant incorporated or used preemergence. See label for specific rates.
	chlorpyrifos <i>R</i> (Lorsban 4E) (Nufos 4E) (Yuma 4E) <i>or</i>	1 to 2 pt	0.5 to 1.0 lb	35	24	Can be applied as an at-plant, preemergence, or postemergence treatment in conservation tillage.
	permethrin <i>R</i> (Artic 3.2EC) (Ambush 25W) (Pounce 25WP)	4 to 12.8 oz	0.10 to 0.20 lb	30	12	Can be used preplant, preemergent, or as a foliar postemergent application. Use higher rate if incorporating into the soil. Maximum of 0.6 lb ai per acre per season.
	(Pounce 1.5G)	8 to 16 oz per 1,000 ft of row	0.15 lb per 1,000 ft of row	30	24	Applied in furrow or as a band. Maximum of 0.6 lb ai per acre per season. See label for details.
Armyworm	<i>Bacillus thuringiensis</i> <i>O</i>	Many formulations are available. See label for rates and restrictions.				May be used to control small armyworms when populations are light. Repeat treatment as necessary.
Responsive Treatments (25% of plants damaged or some plants are being killed)	<i>or</i>					
	bifenthrin <i>R</i> (Brigade 2EC) (Discipline 2EC) <i>or</i>	2.1 to 6.4 oz	0.033 to 0.10 lb	30	12	Do not graze livestock in treated areas or cut treated crops for feed within 30 days of the last application. Do not apply more than 0.3 lb ai per acre per season for all applications.
	bifenthrin <i>R</i> (Capture 1.15G) (Empower 2) <i>or</i>	3.5 to 8.7 lb	0.04 to 0.10 lb	30	24	Do not apply more than 0.3 lb ai per acre per season including at-plant plus foliar applications.
	carbaryl (Sevin) <i>or</i>	Many formulations are available. See label for rates and restrictions.			48	12

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments (read the label for dosage, method, and limitations)
		Formulated	Active	Harvest (days)	Reentry (hours)	
Armyworm (continued)	chlorpyrifos R (Lorsban 4E) (Nufos 4E) (Yuma 4E)	1 to 2 pt	0.5 to 1.0 lb	35	24	Apply postemergence as a broadcast spray.
	(Lorsban 15G) <i>or</i>	6 to 8 oz per 1,000 ft of row		35	24	For foliar insect control, do not exceed 16 oz per 1,000 feet of row.
	chlorpyrifos + gamma- cyhalothrin R (Cobalt)	13 to 26 oz	0.25 to 0.51 lb chlorpyrifos 0.005 to 0.009 lb gamma-cyhalothrin	21	24	Can be use pre- or postemergence; see label for further details. Do not allow meat or dairy animals to graze in treated areas nor harvest treated corn silage as feed within 14 days of last treatment.
	<i>or</i>					
	cyfluthrin R (Baythroid 2) <i>or</i>	1.6 to 2.8 oz	0.025 to 0.044 lb	21	12	Maximum of four applications per acre per season and 11.2 oz per acre.
	deltamethrin R (Delta Gold) <i>or</i>	1.5 to 1.9 oz	0.018 to 0.022 lb	21	12	Apply as necessary to maintain control. Do not apply more than 8.1 oz in a growing season.
	esfenvalerate R (Asana XL) <i>or</i>	5.8 to 9.6 oz	0.03 to 0.05 lb	21	12	Apply as necessary to maintain control. However, more than one application is not cost effective in most situations.
	gamma-cyhalothrin R (Proaxis) <i>or</i>	2.56 to 3.84 oz	0.01 to 0.015 lb	21	12	Apply as necessary to maintain control.
	lambda-cyhalothrin R (Warrior and Warrior II) (Taiga Z) <i>or</i>	1.28 to 3.84 oz	0.02 to 0.03 lb	21	24	See label for details and restrictions. Use higher rates for larger larvae. Warrior II uses half the rate of Warrior.
	methomyl R (Lannate 90SP) (Lannate LV) <i>or</i>	0.25 to 0.50 lb 0.75 to 1.50 pt	0.23 to 0.45 lb	21	48	No more than 2.25 lb ai/crop/season. Apply when insects first appear in significant numbers. This chemical is highly toxic to humans. Lower rates help conserve beneficial arthropods.
	methyl parathion R (PennCap-M) <i>or</i>	2 to 3 pt	0.5 to 0.75 lb	12	5 days	Highly toxic to bees.
	methoxyfenozide (Intrepid 2F) <i>or</i>	4.0 to 8.0 oz	0.06 to 0.12 lb	21	4	Do not apply more than 64 oz per season.
	permethrin R (Artic 3.2EC) (Ambush 25W) (Pounce 25WP) (Pounce 1.5G) <i>or</i>	4 to 12.8 oz 6.7 to 13.3 lb	0.10 to 0.20 lb	30	12 or 24	Apply before the brown silk stage. Pounce 1.5G may be applied as a preplant-incorporated preemergence treatment or at planting time.

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments <i>(read the label for dosage, method, and limitations)</i>
		Formulated	Active	Harvest (days)	Reentry (hours)	
Armyworm (continued)	spinosad (Entrust) O (Tracer) <i>or</i>	0.5 to 3.0 oz		28	4	Do not apply more than 3.75 oz of Entrust or 6 oz of Tracer per acre per year.
	zeta-cypermethrin R (Mustang Max) <i>or</i>	2.8 to 4.0 oz	0.0175 to 0.025 lb	30 (grain) 60 (silage)	12	Do not apply more than 0.10 lb ai per acre per season, including at-plant plus foliar applications.
	zeta-cypermethrin + bifenthrin R (Hero)	4.0 to 10.3 oz	0.04 to 0.10 lb	30 (grain) 60 (forage)	12	Do not make applications less than 30 days apart. Do not apply more than 0.40 lb ai per season. Only for use as a foliar application.
Billbugs Threshold: None estab- lished. Rescue treatment is warranted when damage is widespread and adults can be found.	chlorpyrifos R (Lorsban 4E) (Nufos 4E) (Yuma 4E) <i>or</i>	2 pt	2 lb	35	24	
	(Lorsban 15G) <i>or</i>	8 oz per 1,000 ft of row	1 lb	35	24	Billbugs usually are a pest only in fields with yellow nutsedge. Apply Lorsban 15G as a band over the row.
	chlorpyrifos + gamma- cyhalothrin R (Cobalt) <i>or</i>	38 to 42 oz	0.74 to 0.82 lb chlorpyrifos 0.013 to 0.015 lb gamma-cyhalothrin	21	24	Can be use pre- or postemergence; see label for further details. Do not allow meat or dairy animals to graze in treated areas or harvest treated corn silage as feed within 14 days of last treatment.
	fipronil R (Regent 4SC) <i>or</i>	0.24 oz per 1,000 ft of row		90	0	No more than 3 lb ai per season in a band or 0.13 lb per acre.
	tefluthrin R (Force 3.0G) <i>or</i>	4 to 5 oz per 1,000 ft of row	0.10 to 0.12 lb	30	0	At-planting applications can be placed in a 7-inch band over the row in front or behind the press wheel, or in furrow.
	terbufos R (Counter 15G)	6 to 8 oz per 1,000 ft of row	0.75 to 1 lb	30	48	In-furrow applications reduce the potential for insecticide runoff resulting from excessive rain.
Seed Treatments						
	thiamethoxam (Cruiser 5FS) <i>or</i>	1.25 mg per kernel				Not for hopperbox treatment.
	clothianidin (Poncho 600)	1.25 mg per kernel				Not for hopperbox treatment.

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Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments (read the label for dosage, method, and limitations)
		Formulated	Active	Harvest (days)	Reentry (hours)	
Corn Leaf and Oat Bird-Cherry Aphids Threshold: 50% or more plants with colonies of 100 or more aphids, and 3% or more plants with heavily infested tassels and or upper leaves	bifenthrin R (Brigade 2EC) (Discipline 2EC)	2.1 to 6.4 oz	0.033 to 0.10 lb	30	12	Direct spray to cover foliage.
	or					
	chlorpyrifos R (Lorsban 4E) (Nufos 4E) (Yuma 4E)	1 to 2 pt	0.5 to 1.0 lb	35	24	See label for specific application information.
	or					
	chlorpyrifos + gamma-cyhalothrin R (Cobalt)	13 to 26 oz	0.25 to 0.51 lb chlorpyrifos 0.005 to 0.009 lb gamma-cyhalothrin	21	24	Do not allow meat or dairy animals to graze in treated areas or harvest treated corn silage as feed within 14 days of last treatment.
	or					
	deltamethrin R (Delta Gold)	1.5 to 1.9 oz	0.018 to 0.022 lb	21	12	Do not apply more than 8.1 oz per season. Suppression only.
	or					
	dimethoate	Many formulations are available. See label for rates and restrictions				Same as corn rootworm beetles.
	or					
	esfenvalerate R (Asana XL)	5.8 to 9.6 oz	0.03 to 0.05 lb	21	12	Direct spray at aphid population. Aphids not contacted by spray, such as in the whorls and leaf axis, may not be controlled adequately.
	or					
	gamma-cyhalothrin R (Proaxis)	2.56 to 3.84 oz	0.01 to 0.015 lb	21	12	Apply as necessary to maintain control.
	or					
	lambda-cyhalothrin R (Warrior and Warrior II) (Taiga Z)	1.28 to 3.84 oz	0.02 to 0.03 lb	21	24	Suppression only. See label for details and restrictions. Warrior II uses half the rate of Warrior.
or						
methomyl R (Lannate LV) (Lannate 90SP)	0.75 to 1.5 pt 0.25 to 0.5 lb	0.23 to 0.45 lb	21	48	No more than 2.25 lb ai/crop/season. Apply when insects first appear in significant numbers. Highly toxic to humans. Lower rates help conserve beneficial arthropods.	
or						
methyl parathion R (PennCap-M)	2 to 3 pt	0.5 to 0.75 lb	12	5 days	To avoid injuring bees, do not apply during pollen shed if bees are visiting the area to be treated during their normal foraging hours.	
or						
phorate R (Phorate 20G)	5.0 lb	1.0 lb	30	48	Broadcast into whorls.	
or						
zeta-cypermethrin R (Mustang Max)	2.72 to 4.0 oz	0.017 to 0.025 lb	30 (grain) 60 (silage)	12	Do not apply more than 0.10 lb ai per acre per season, including at-plant plus foliar applications.	
or						

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments (read the label for dosage, method, and limitations)
		Formulated	Active	Harvest (days)	Reentry (hours)	
	zeta-cypermethrin + bifenthrin R (Hero)	4.0 to 10.3 oz	0.04 to 0.10 lb	30 (grain) 60 (forage)	12	Do not make applications less than 30 days apart. Do not apply more than 0.40 lb ai per season. Only for use as a foliar application.
Corn Root-worm Beetle Threshold: Control usually is not needed. Treatments are not suggested unless there is an average of 5 beetles/ear and the corn is less than 50% brown silk.	bifenthrin R (Brigade 2EC) (Discipline 2EC)	2.1 to 6.4 oz	0.033 to 0.10 lb	30	12	Direct spray over tassel and into ear zone. Do not apply more than 0.2 lb ai/A/season.
	<i>or</i>					
	carbaryl	Many formulations are available. See label for rates and restrictions.		14		These compounds are suggested alternatives because of their relatively low toxicity to humans. Keep in mind, however, that all insecticides should be handled with care. See the label for specific uses, rates, and restrictions.
	<i>or</i>					
	cyfluthrin R (Baythroid 2)	1.6 to 2.8 oz	0.025 to 0.044 lb	21	12	Maximum of four applications per acre per season and 11.2 oz per acre.
	<i>or</i>					
	chlorpyrifos R (Lorsban 4E) (Nufos 4E) (Yuma 4E)	1 to 2 pt	0.5 to 1.0 lb	35	24	See label for restrictions.
	<i>or</i>					
	chlorpyrifos + gamma-cyhalothrin R (Cobalt)	13 to 26 oz	0.25 to 0.51 lb chlorpyrifos 0.005 to 0.009 lb gamma-cyhalothrin	21	24	Rate will control silk clipping by adults. Do not allow meat or dairy animals to graze in treated areas or harvest treated corn silage as feed within 14 days of last treatment.
	<i>or</i>					
deltamethrin R (Delta Gold)	1.5 to 1.9 oz	0.018 to 0.022 lb	21	12	Apply as necessary to maintain control. Do not apply more than 8.1 oz in a growing season.	
<i>or</i>						
dimethoate	Many formulations are available. See label for rates and restrictions.					See label for rates and restrictions. Not more than 3 applications per year. Do not apply to corn during the pollen shedding period.
<i>or</i>						
esfenvalerate R (Asana XL)	5.8 to 9.6 oz	0.03 to 0.05 lb	21	12	Control should be instigated only if an economic level of rootworm beetles is observed. Once the silks turn brown, control is no longer necessary. Apply at first sign of silk feeding.	
<i>or</i>						
gamma-cyhalothrin R (Proaxis)	2.56 to 3.84 oz	0.01 to 0.015 lb	21	12	Apply as necessary to maintain control.	
<i>or</i>						
lambda-cyhalothrin R (Warrior and Warrior II) (Taiga Z)	1.28 to 3.84 oz	0.02 to 0.03 lb	21	24	For corn rootworm control as part of an aerial applied control program, use a minimum of 3.8 oz per acre (0.03 lb ai per acre). See label for details and restrictions. Warrior II uses half the rate of Warrior.	
<i>or</i>						

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments <i>(read the label for dosage, method, and limitations)</i>
		Formulated	Active	Harvest (days)	Reentry (hours)	
	methomyl R (Lannate 90SP) (Lannate LV)	0.25 to 0.50 lb 0.75 to 1.50 pt	0.23 to 0.45 lb	21	48	No more than 2.25 lb ai/crop/season. Apply when insects first appear in significant numbers. This chemical is highly toxic to humans. Lower rates help conserve beneficial arthropods.
	<i>or</i>					
	methyl parathion R (Penncap-M)	1 to 2 pt	0.25 to 0.50 lb	12	5 days	To avoid injury to bees, do not apply during pollen shed if bees are visiting areas to be treated during normal foraging hours.
	<i>or</i>					
	permethrin R (Artic 3.2EC) (Ambush 25W) (Pounce 25WP)	4 to 12.8 oz	0.10 to 0.20 lb	30	12	See label for further limitations.
	<i>or</i>					
	zeta-cypermethrin R (Mustang Max)	2.72 to 4.0 oz	0.017 to 0.025 lb	30 (grain) 60 (silage)	12	Do not apply more than 0.10 lb ai per acre per season, including at-plant plus foliar applications.
	<i>or</i>					
	zeta-cypermethrin + bifenthrin R (Hero)	4.0 to 10.3 oz	0.04 to 0.10 lb	30 (grain) 60 (forage)	12	Do not make applications less than 30 days apart. Do not apply more than 0.40 lb ai per season. Only for use as a foliar application.
Corn Rootworm Larva	bifenthrin R (Capture 1.15G) (Empower 2EC)	6.4 to 8.0 oz per 1,000 ft of row	0.005 to 0.006 lb per row ft	30	24	Apply as a 5- to 7-inch T-band treatment. Use high rate for heavy insect pressure. Do not apply more than 0.1 lb ai per acre per season, including at-plant plus foliar applications. Highly toxic to bees.
Threshold: Number of beetles/plant in August. NCR WCR First year: 2.0 1.0 2 or more years of corn: 3.0 1.5	<i>or</i>					
	bifenthrin R (Brigade 2EC) (Discipline 2EC)	0.30 oz per 1,000 ft of row	0.0046 lb per 1,000 ft of row	30	12	Apply as a 5- to 7-inch T-band over an open seed furrow. Apply a minimum of 3 gal/A by ground. Straw may not be used for food or feed.
	<i>or</i>					
	chlorothoxyfos R (Fortress 5.0G) (Fortress 2.5G)	3.0 to 4.5 oz 7.5 to 9.0 oz per 1,000 ft of row	0.12 to 0.18 lb 0.12 to 0.18 lb per 1,000 ft of row	30	48	Fortress is recommended as a T-band application.
	<i>or</i>					
	chlorpyrifos R (Lorsban 15G)	8 oz per 1,000 ft of row	1 lb	35	24	Do not exceed 1 lb ai/A.
	(Lorsban 4E) (Nufos 4E) (Yuma 4E)	2.4 oz per 1,000 ft of row	1.3 lb	35	24	See label for restrictions.
	<i>or</i>					
	chlorpyrifos + gamma-cyhalothrin R (Cobalt)	38 to 42 oz	0.74 to 0.82 lb chlorpyrifos 0.013 to 0.015 lb gamma-cyhalothrin	21	24	Can be used postemergence at cultivation or via irrigation system; see label for further details. Do not allow meat or dairy animals to graze in treated areas or harvest treated corn silage as feed within 14 days of last treatment.
	<i>or</i>					

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments <i>(read the label for dosage, method, and limitations)</i>
		Formulated	Active	Harvest (days)	Reentry (hours)	
Corn Rootworm Larva (continued)	ethoprop <i>R</i> (Mocap 15G)	8 oz per 1,000 ft of row	7.0 lb	See label		Apply at planting.
	<i>or</i>					
	fipronil <i>R</i> (Regent 4SC)	0.24 oz per 1,000 ft of row	0.13 lb	90	0	This product must be applied using microtube applicators. A good corn rootworm material under most environmental conditions. However, because it has low solubility in water, the product does not work well in dry years. May provide some suppression of European corn borer when applied at planting.
	<i>or</i>					
	gamma-cyhalothrin <i>R</i> (Proaxis)	0.66 oz per 1,000 ft of row	0.0025 lb per 1,000 ft of row	21	12	Apply as a band.
	<i>or</i>					
	lambda-cyhalothrin <i>R</i> (Warrior and Warrior II) (Taiga Z)	0.33 to 0.66 oz per 1,000 ft of row	0.005 lb per 1,000 ft of row	21	12	Apply as a band. See label for details and restrictions. Warrior II uses half the rate of Warrior.
	<i>or</i>					
	phorate <i>R</i> (Phorate 20G)	6 oz per 1,000 ft of row	1 lb	30	48	Do not apply more than 6.5 lb of Phorate 20G per acre. Do not use in-furrow application. Apply in a 7-inch band over the row directly behind the planter shoe in front of or behind the press wheel and lightly incorporate.
	<i>or</i>					
tefluthrin <i>R</i> (Force 3.0G)	4 to 5 oz per 1,000 ft of row	0.10 to 0.12 lb	30	0	At-planting applications can be placed in a 7-inch band over the row in front or behind the press wheel, or in furrow. When applied at cultivation, place at the base of plants on both sides of the plant (split boot). Cover the treated band with 2 to 3 inches of soil.	
<i>or</i>						
tebupirimphos <i>R</i> plus cyfluthrin (Aztec 2.1G) (Defcon 2.1G) (Aztec 4.67G)	3.0 to 6.7 oz per 1,000 ft of row	0.12 lb	30	48	Apply as a T-band or in-furrow. Incorporate into the soil surface. A maximum rate of 7.3 lb material per acre per season.	
<i>or</i>						
terbufos <i>R</i> (Counter 15G)	6 to 8 oz per 1,000 ft of row	0.75 to 1 lb	30	48	Do not exceed 8.7 lb per acre. Counter is one of the few compounds that can help reduce some nematode populations.	
Seed Treatments						
	thiamethoxam (Cruiser 5FS)	1.25 mg per kernel				Not for hopperbox treatment. Research suggests only effective against low- to moderate-sized rootworm populations
	<i>or</i>					
	clothianidin (Poncho 600)	1.25 mg per kernel				Not for hopperbox treatment. Research suggests only effective against low- to moderate-sized rootworm populations.

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments <i>(read the label for dosage, method, and limitations)</i>
		Formulated	Active	Harvest (days)	Reentry (hours)	
Corn rootworm larva notes:						
<ul style="list-style-type: none"> Liquid formulations have advantages: they are cheaper and may be mixed with some herbicides and liquid fertilizers to reduce application cost; however, the relatively high content of active toxicant in liquid formulations makes them more hazardous to handle than granules. Use of an organophosphate insecticide, such as Lorsban, Phorate, or Counter, with a sulfonylurea postemergence herbicide can cause corn plant injury. Counter shows the greatest tendency for this because of its systemic properties, but the CR20 formulation has helped reduce this problem. For band application, the rate (oz per 1,000 ft of row) is constant and independent of row spacing. Therefore, lb of formulation needed per acre increases as row spacing decreases. Read the label to determine the proper rate for your own row spacing. Research indicates that at-planting insecticide applications may have a reduced level of effectiveness when corn is planted before May 1. Larvae are believed to begin hatching between June 1 and June 15 in central Pennsylvania. The total hatching period is three to four weeks long. Hatch may occur 7 to 10 days earlier in southern areas of the state and 7 to 10 days later in more northern and higher elevations. Under average conditions most rootworm insecticides remain effective for approximately 6 to 8 weeks. An alternative to at-planting application is at-cultivation or sidedress between June 1 and 10 (possibly a week earlier in southern areas). All formulations of pesticides should be handled in accordance with safety precautions. Read the label. 						
Cutworm Insurance note: This approach is recommended only if labor and time are constraints and a field has had a history of problems with this pest.	azadirachtin O (Neemix 4.5)	0.25 to 1.0 pt	NA		12	Use a minimum of 30 gallons of water per acre during application. The compound interferes with an insect's ability to molt and may repel or deter feeding by the insect. May require multiple applications to provide adequate control. Little data on effectiveness on these pests, but it is a natural product.
	<i>or</i>					
	bifenthrin R (Capture 1.15G) (Empower 2EC)	3.2 to 8.0 oz per 1,000 ft of row	0.002 to 0.006 lb per 1,000 ft of row	30	7	Do not apply more than 0.3 lb ai per acre per season, including at-plant plus foliar applications. Highly toxic to bees.
	<i>or</i>					
	bifenthrin R (Brigade 2EC) (Discipline 2EC)	0.15 to 0.30 oz per 1,000 ft of row	0.0023 to 0.0046 lb per 1,000 ft of row	30	12	Do not apply more than 0.1 lb ai per acre per season as an at-plant application for all applications. See label for other manners of application.
	<i>or</i>					
	bifenthrin R (Capture LFR)	3.4 to 5.3 oz	0.04-0.062 lb		12	For mixing directly with liquid fertilizer to control soil insect pests. Can be preplant incorporated or used preemergence. See label for specific rates.
	<i>or</i>					
	chlorethoxyfos R (Fortress 5.0G) (Fortress 2.5G)	3.0 to 7.5 oz per 1,000 ft of row	0.12 to 0.18 lb	30	48	Recommended as a T-band application.
	<i>or</i>					
chlorpyrifos R (Lorsban 15G)	8 to 16 oz per 1,000 ft of row	1 to 2 lb	35	24	Apply 7-inch band in front of the press wheel and incorporate treatments into the top 1 inch of soil using tines chains.	
(Lorsban 4E) (Nufos 4E) (Yuma 4E)	2.4 oz per 1,000 ft of row	1.3 lb	35	24	Do not apply more than a total of 6 pints per acre per season. Do not allow livestock to graze in treated areas or harvest treated corn silage as feed for meat or dairy animals within 14 days after last treatment.	
<i>or</i>						
chlorpyrifos + gamma- cyhalothrin R (Cobalt)	13 to 26 oz	0.25 to 0.51 lb chlorpyrifos 0.005 to 0.009 lb gamma-cyhalothrin	21	24	Can be use pre- or postemergence; see label for further details. Do not allow meat or dairy animals to graze in treated areas or harvest treated corn silage as feed within 14 days of last treatment.	
<i>or</i>						

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments (read the label for dosage, method, and limitations)
		Formulated	Active	Harvest (days)	Reentry (hours)	
Cutworm (continued)	esfenvalerate R (Asana XL)	0.45 oz per 1,000 ft of row	0.0023 lb per 1,000 ft of row	21	12	Apply as in furrow or as a band.
	<i>or</i>					
	ethoprop R (Mocap 15G)	8.0 oz per 1,000 ft of row	7.0 lb	See label		Apply as a band. Only one application per crop.
	<i>or</i>					
	gamma-cyhalothrin R (Proaxis)	0.66 oz per 1,000 ft of row	0.0025 lb per 1,000 ft of row	21	12	See label for application.
	<i>or</i>					
	lambda-cyhalothrin R (Warrior and Warrior II) (Taiga Z)	0.33 to 0.66 oz per 1,000 ft of row	0.005 lb per 1,000 ft of row	21	24	See label for details and restrictions. Warrior II uses half the rate of Warrior.
	<i>or</i>					
	permethrin R (Artic 3.2EC) (Ambush 25W) (Pounce 25W)	4 to 12.8 oz	0.10 to 0.20 lb	30	12 or 24	See label for rates and restrictions. May be applied preplant, preemergent, or foliar postemergent application.
	(Pounce 1.5G)	8 oz per 1,000 ft of row	0.10 to 0.20 lb	30	24	
	<i>or</i>					
	tebupirimphos R plus cyfluthrin (Aztec 2.1G) (Defcon 2.1) (Aztec 4.67G)	3.0 to 6.7 oz per 1,000 ft of row	0.12 lb		48	Apply as a T-band. Incorporate into the soil surface. A maximum rate of 73 lb material per acre per season.
	<i>or</i>					
terbufos R (Counter 15G)	6 to 8 oz per 1,000 ft of row	0.75 to 1 lb	30	48	Suppression only. Do not exceed 8.7 lb of Counter 15G per acre. Counter is one of the few compounds that can help reduce some nematode populations.	
<i>or</i>						
tefluthrin R (Force 3.0G)	3 to 4 oz per 1,000 ft of row	0.08 to 0.10 lb	30	0	This compound is an excellent rootworm and black cutworm insecticide when applied at planting. The best option when a field has a known history of cutworm or problems are anticipated.	
<i>or</i>						
zeta-cypermethrin R (Mustang Max)	0.16 oz per 1,000 ft of row	0.001 lb per 1,000 ft of row	30 (grain) 60 (grain)	12	Do not apply more than 0.10 lb ai per acre per season, including at-plant plus foliar applications.	
Seed Treatments						
	thiamethoxam (Cruiser 5FS)	0.25 or 1.25 mg per kernel				Not for hopperbox treatment. Suppression only.
	<i>or</i>					
	clothianidin (Poncho 600)	0.25 or 1.25 mg per kernel				Not for hopperbox treatment.

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments <i>(read the label for dosage, method, and limitations)</i>
		Formulated	Active	Harvest (days)	Reentry (hours)	
Cutworm Responsive Treatments Threshold: Plants cut per 100: Seedling: 2 V2: 3 V3: 5 V4: 7 V5: Seldom an economic problem	azadirachtin O (Neemix 4.5)	0.25 to 1.0 pt	NA		12	Use a minimum of 30 gallons of water per acre during application. The compound interferes with an insect's ability to molt and may repel or deter feeding by the insect. May require multiple applications to provide adequate control. Little data on effectiveness on these pests, but it is a natural product. Do not graze livestock in treated areas or cut treated crops for feed within 30 days of the last application. Do not apply more than 0.1 lb ai per acre per season. Do not apply when bees are foraging (pollination period in the field). Maximum of four applications per acre per season and 11.2 oz per acre. Apply as a broadcast spray when field counts indicate that pests area or may become a problem. Do not apply more than a total of 6 pints per acre per season. Do not allow livestock to graze in treated areas nor harvest treated corn silage as feed for meat or dairy animals within 14 days after last treatment. Can be use pre- or postemergence; see label for further details. Do not allow meat or dairy animals to graze in treated areas or harvest treated corn silage as feed within 14 days of last treatment. Apply as necessary to maintain control. Do not apply more than 8.1 oz in a growing season. Apply as necessary to maintain control. See label for further restrictions and uses.
	<i>or</i>	Many formulations are available. See label for rates and restrictions.				
	<i>Bacillus thuringiensis</i> O	Many formulations are available. See label for rates and restrictions.				
	<i>or</i>					
	bifenthrin R (Brigade 2EC) (Discipline 2EC)	2.1 to 6.4 oz	0.033 to 0.10 lb	30	12	
	<i>or</i>	Many formulations are available. See label for rates and restrictions.		12		
	carbaryl (Sevin)	Many formulations are available. See label for rates and restrictions.		12		
	<i>or</i>					
	cyfluthrin R (Baythroid 2)	0.8 to 1.6 oz	0.013 to 0.025 lb	21	12	
	<i>or</i>					
chlorpyrifos R (Lorsban 4E) (Nufos 4E) (Yuma 4E)	1 to 2 pt	0.5 to 1.0 lb	35	24		
<i>or</i>						
chlorpyrifos + gamma-cyhalothrin R (Cobalt)	13 to 26 oz	0.25 to 0.51 lb chlorpyrifos 0.005 to 0.009 lb gamma-cyhalothrin	21	24		
<i>or</i>						
deltamethrin R (Delta Gold)	1.0 to 1.5 oz	0.012 to 0.018 lb	21	12		
<i>or</i>						
esfenvalerate R (Asana XL)	5.8 to 9.6 oz	0.03 to 0.05 lb	21	12		
<i>or</i>						
gamma-cyhalothrin R (Proaxis)	1.92 to 3.2 oz	0.0075 to 0.0125 lb	21	12		
<i>or</i>						

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments <i>(read the label for dosage, method, and limitations)</i>
		Formulated	Active	Harvest (days)	Reentry (hours)	
Cutworm (continued)	lambda-cyhalothrin R (Warrior and Warrior II) (Taiga Z)	0.96 to 3.2 oz	0.015 to 0.025 lb	21	24	Timing and frequency of spray should be based on when insect populations reach economic thresholds. See label for details and restrictions. Warrior II uses half the rate of Warrior.
	<i>or</i>					
	methyl parathion R (Penncap-M)	4 pt	1 lb	12	5 days	A microcapsulate form of methyl parathion. For best control, apply under moist soil conditions.
	<i>or</i>					
	permethrin R (Artic 3.2EC) (Ambush 25W) (Pounce 25WP)	4 to 12.8 oz	0.10 to 0.20 lb	30	12	This insecticide is very effective at controlling black cutworm larvae. Do not exceed a total of 0.6 lb ai/A/season.
	(Pounce 1.5G)	6.7 to 13.3 lb	0.10 to 0.20 lb	30	24	
<i>or</i>						
	zeta-cypermethrin R (Mustang Max)	1.28 to 2.8 oz	0.008 to 0.0175 lb	30 (grain) 60 (grain)	12	Do not apply more than 0.10 lb ai per acre per season, including at-plant plus foliar applications.
<i>or</i>						
	zeta-cypermethrin + bifenthrin R (Hero)	2.60 to 6.1 oz	0.025 to 0.06 lb	30 (grain) 60 (forage)	12	Do not make applications less than 30 days apart. Do not apply more than 0.40 lb ai per season. Only for use as a foliar application.
Cutworm notes:						
Ambush, Asana, Penncap-M, and Pounce are suggested where black cutworm is a major problem. Insurance treatments for cutworm are effective only if cutworms are present soon after planting. Responsive treatments are not effective unless the insects come in contact with the insecticide. Under dry conditions, cutworms tend to remain underground, not contacting surface-applied insecticide. It is advisable to apply most chemicals in the evening and when the soil is moist. Under dry conditions, cultivation after an insecticide application will help.						
European Corn Borer, First Generation	<i>Bacillus thuringiensis</i> O	Many formulations are available. See label for rates and restrictions.				Time applications to egg hatch. Small larvae are more susceptible to compounds. Treat when newly hatched larvae are present and the first feeding damage is observed. See label for further directions.
	<i>or</i>					
Threshold: See chart in the Field Crop IPM Reference and Training Manual to calculate economic threshold.	bifenthrin R (Capture 1.15G) (Empower 2EC)	3.5 to 8.7 lb per 1,000 ft of row	0.04 to 0.10 lb per 1,000 ft of row	30	7	Apply as a broadcast application when insect injury is first noticed or phenology models indicate the initiation of first instars. Do not apply more than 0.1 lb ai per acre per season as an at-plant application. Do not apply more than 0.3 lb ai per acre per season including at-plant plus foliar applications. Highly toxic to bees.
	(Brigade 2EC) (Discipline 2EC)	2.1 to 6.4 oz	0.033 to 0.10 lb	30	12	
	<i>or</i>					
	carbaryl (Sevin)	Many formulations are available. See label for rates and restrictions.				See the label for specific uses, rates, and restrictions. These compounds are suggested alternatives because of their relatively low toxicity to humans. Keep in mind, however, that all insecticides should be handled with care.
<i>or</i>						

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments <i>(read the label for dosage, method, and limitations)</i>
		Formulated	Active	Harvest (days)	Reentry (hours)	
European Corn Borer, First Generation (continued)	cyfluthrin R (Baythroid 2)	1.6 to 2.8 oz	0.025 to 0.044 lb	21	12	Maximum of four applications per acre per season and 11.2 oz per acre.
	<i>or</i>					
	chlorpyrifos R (Lorsban 15G)	3.5 to 8 oz per 1,000 ft of row	0.75 to 1.0 lb	35	12	Do not allow livestock to graze in treated areas or harvest treated corn silage as feed for meat or dairy animals within 14 days after last treatment. Lorsban 15G rates/A are based on 40-inch rows. Use lower rate when populations are low to moderate.
	<i>or</i>					
	chlorpyrifos R (Lorsban 4E) (Nufos 4E) (Yuma 4E)	1.5 to 2 pt	0.5 to 1.0 lb	35	24	Apply as a broadcast spray when field counts indicate that pests area or may become a problem. Do not allow livestock to graze in treated areas or harvest treated corn silage as feed for meat or dairy animals within 14 days after last treatment.
	<i>or</i>					
	chlorpyrifos + gamma-cyhalothrin R (Cobalt)	19 to 38 oz	0.25 to 0.51 lb chlorpyrifos 0.005 to 0.009 lb gamma-cyhalothrin	21	24	Can be applied by sprayer or irrigation system, see label for further details. Do not allow meat or dairy animals to graze in treated areas or harvest treated corn silage as feed within 14 days of last treatment.
	<i>or</i>					
	deltamethrin R (Delta Gold)	1.5 to 1.9 oz	0.018 to 0.022 lb	21	12	Apply as necessary to maintain control. Do not apply more than 8.1 oz in a growing season.
	<i>or</i>					
	esfenvalerate R (Asana)	7.8 to 9.6 oz	0.04 to 0.05 lb	21	12	Use higher rates for higher insect pressure.
	<i>or</i>					
	fipronil R (Regent 4SC)	0.24 oz per 1,000 ft of row	0.13 lb per 1,000 ft of row	90	0	This product must be applied using microtube applicators. A good corn rootworm material under most environmental conditions. However, because it has low solubility in water, the product does not work well in dry years. May provide some suppression of European corn borer when applied at planting.
<i>or</i>						
gamma-cyhalothrin R (Proaxis)	2.56 to 3.84 oz	0.01 to 0.015 lb	21	12	See label for additional limitations and uses.	
<i>or</i>						
lambda-cyhalothrin R (Warrior and Warrior II) (Taiga Z)	1.28 to 3.84 oz	0.02 to 0.03 lb	21	24	For control before the larva bores into the plant stalk or ear. See label for details and restrictions. Warrior II uses half the rate of Warrior.	
<i>or</i>						
methyl parathion R (PennCap-M)	2 to 4 pt	0.50 to 1.0 lb	12	5 days	See label for further limitations and uses.	
<i>or</i>						

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments (read the label for dosage, method, and limitations)
		Formulated	Active	Harvest (days)	Reentry (hours)	
European Corn Borer, First Generation (continued)	methoxyfenozide (Intrepid 2F)	4.0 to 8.0 oz	0.06 to 0.12 lb	21	4	Do not apply more than 64 oz per season.
	<i>or</i>					
	permethrin R (Pounce 1.5G)	6.7 to 13.3 lb	0.10 to 0.20 lb	30	12	Apply in band over whorl stage corn plants.
	(Artic 3.2EC) (Ambush 25 W) (Pounce 25 W)	4 to 12.8 oz	0.10 to 0.20 lb	30	24	Apply every 5 days as needed.
	<i>or</i>					
	phorate R (Phorate 20G)	5.0 lb	1.0 lb	30	48	Broadcast into whorl.
	<i>or</i>					
	spinosad O (Entrust) (Tracer)	0.5 to 3.0 oz		28	4	Do not apply more than 3.75 oz of Entrust or 6 oz of Tracer per acre per year.
	<i>or</i>					
	zeta-cypermethrin R (Mustang Max)	2.72 to 4.0 oz	0.017 to 0.025 lb	30 (grain) 60 (silage)	12	Do not apply more than 0.10 lb ai per acre per season, including at-plant plus foliar applications.
<i>or</i>						
zeta-cypermethrin + bifenthrin R (Hero)	4.0 to 10.3 oz	0.04 to 0.10 lb	30 (grain) 60 (forage)	12	Do not make applications less than 30 days apart. Do not apply more than 0.40 lb ai per season. Only for use as a foliar application.	
European corn borer, first generation notes:						
<ul style="list-style-type: none"> The granular formulations are recommended for first-generation control because they stay in the whorl where small corn borer larvae are feeding. Liquid formulations stick to leaves and move out of the whorl region as the plant grows. Granulars should be directed into the whorl when applied. Of the treatments listed, Lorsban have been the most consistent in performance. 						
European Corn Borer, Second Generation	<i>Bacillus thuringiensis</i> O	Many formulations are available. See label for rates and restrictions.				Time applications to egg hatch. Small larvae are more susceptible to compounds.
	<i>or</i>					
	bifenthrin R (Brigade 2EC) (Discipline 2EC)	2.1 to 6.4 oz	0.033 to 0.10 lb	30	12	Direct spray over tassel and into ear zone.
	<i>or</i>					
	carbaryl (Sevin)	Many formulations are available. See the label for specific uses, rates, and restrictions.				These compounds are suggested alternatives because of their relatively low toxicity to humans. Keep in mind, however, that all insecticides should be handled with care.
	<i>or</i>					
Threshold: Variable: See the Field Crop IPM Training and Reference Manual. A computer model exists to help time insecticide applications.	cyfluthrin R (Baythroid 2)	1.6 to 2.8 oz	0.025 to 0.044 lb	21	12	Maximum of four applications per acre per season and 11.2 oz per acre.
	<i>or</i>					
	chlorpyrifos R (Lorsban 4E) (Nufos 4E) (Yuma 4E)	1 to 2 pt	0.50 to 1.0 lb	35	24	Do not allow livestock to graze in treated areas or harvest treated corn silage as feed for meat or dairy animals within 14 days after last treatment. Use lower rate when populations are low to moderate.
<i>or</i>						

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments (read the label for dosage, method, and limitations)
		Formulated	Active	Harvest (days)	Reentry (hours)	
European Corn Borer, Second Generation (continued)	(Lorsban 1.5G)	6.5 lb				Applied aerially.
	<i>or</i>					
	deltamethrin R (Delta Gold)	1.5 to 1.9 oz	0.018 to 0.022 lb	21	12	Apply as necessary to maintain control. Do not apply more than 8.1 oz in a growing season.
	<i>or</i>					
	esfenvalerate R (Asana XL)	7.8 to 9.6 oz	0.04 to 0.05 lb	21	12	Use higher rates for higher insect pressure.
	<i>or</i>					
	gamma-cyhalothrin R (Proaxis)	2.56 to 3.84 oz	0.01 to 0.015 lb	21	12	See label for limitations and further uses.
	<i>or</i>					
	lambda-cyhalothrin R (Warrior and Warrior II) (Taiga Z)	1.28 to 3.84 oz	0.02 to 0.03 lb	21	24	For control before the larva bores into the plant stalk or ear. See label for details and restrictions. Warrior II uses half the rate of Warrior.
	<i>or</i>					
	methyl parathion R (PennCap-M)	2 to 4 pt	0.50 to 1 lb	12	5 days	To avoid injuring bees, do not apply during pollen shed if bees are visiting the area to be treated during their normal foraging hours.
	<i>or</i>					
	methoxyfenozide (Intrepid 2F)	4.0 to 8.0 oz	0.06 to 0.12 lb	21	4	Do not apply more than 64 oz per season.
	<i>or</i>					
permethrin R (Pounce 1.5G)	6.7 to 13.3 lb	0.10 to 0.20 lb	30	12	Apply in band over whorl stage corn plants.	
(Artic 3.2EC) (Ambush 25 W) (Pounce 25 W)	4 to 12.8 oz	0.10 to 0.20 lb	30	24	Apply 5 days as needed.	
<i>or</i>						
spinosad O (Entrust) (Tracer)	0.5 to 3.0 oz		28	4	Do not apply more than 3.75 oz of Entrust or 6 oz of Tracer per acre per year.	
<i>or</i>						
zeta-cypermethrin R (Mustang Max)	2.72 to 4.0 oz	0.017 to 0.025 lb	30 (grain) 60 (silage)	12	Do not apply more than 0.10 lb ai per acre per season, including at-plant plus foliar applications.	
<i>or</i>						
zeta-cypermethrin + bifenthrin R (Hero)	4.0 to 10.3 oz	0.04 to 0.10 lb	30 (grain) 60 (forage)	12	Do not make applications less than 30 days apart. Do not apply more than 0.40 lb ai per season. Only for use as a foliar application.	

European corn borer, second generation notes:

- When treating for second generation, use drop nozzles on ground application equipment. Direct spray into the ear zone because 90% of the small larvae will be in this area.
- Time sprays for when the majority of eggs are hatching or in the blackhead stage. Improperly timed sprays will be ineffective because newly hatched larvae soon reach sheltered areas of the plant.

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments (read the label for dosage, method, and limitations)	
		Formulated	Active	Harvest (days)	Reentry (hours)		
Fall Army-worm Threshold: 75% of plants showing feeding in whorl, and live larvae	<i>Bacillus thuringiensis</i> O	Many formulations are available. See label for rates and restrictions.					
	<i>or</i>						
	azadirachtin O (Neemix 4.5)	0.25 to 1.0 pt	NA		12	Use a minimum of 30 gallons of water per acre during application. The compound interferes with an insect's ability to molt and may repel or deter feeding by the insect. May require multiple applications to provide adequate control. Little data on effectiveness on these pests, but it is a natural product.	
	<i>or</i>						
	bifenthrin R (Brigade 2EC) (Discipline 2EC)	2.1 to 6.4 oz	0.033 to 0.10 lb	30	12	Direct spray over tassel and into ear zone.	
	(Capture LFR)	3.4 to 5.3 oz	0.04 to 0.062 lb		2	For mixing directly with liquid fertilizer to control soil insect pests. Can be preplant incorporated or used preemergence. See label for specific rates.	
	<i>or</i>						
	carbaryl (Sevin)	Many formulations are available. See label for rates and restrictions.		0	12	Do not apply when bees are foraging (pollination period in the field). See label for rates.	
	<i>or</i>						
	cyfluthrin R (Baythroid 2)	2.8 oz	0.044 lb	21	12	Maximum of four applications per acre per season and 11.2 oz per acre. For use against first and second instars.	
	<i>or</i>						
	deltamethrin R (Delta Gold)	1.5 to 1.9 oz	0.018 to 0.022 lb	21	12	Apply as necessary to maintain control. Do not apply more than 8.1 oz in a growing season.	
	<i>or</i>						
	gamma-cyhalothrin R (Proaxis)	2.56 to 3.84 oz	0.01 to 0.015 lb	21	12	See label for further limitations and uses.	
<i>or</i>							
lambda-cyhalothrin R (Warrior and Warrior II) (Taiga Z)	1.28 to 3.84 oz	0.02 to 0.03 lb	21	24	For control of first and second instars only. See label for details and restrictions. Warrior II uses half the rate of Warrior.		
<i>or</i>							
methomyl R (Lannate LV) (Lannate 90SP)	0.75 to 1.5 pt 0.25 to 0.5 lb	0.23 to 0.45 lb	21	48	No more than 2.25 lb ai/crop/season. Apply when insects first appear in significant numbers. This chemical is highly toxic to humans. Lower rates help conserve beneficial arthropods.		
<i>or</i>							
permethrin R (Artic 3.2) (Ambush 25W) (Pounce 25W)	4 to 12.8 oz	0.10 to 0.20 lb	30	12	See label for further limitations and uses.		
<i>or</i>							

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments <i>(read the label for dosage, method, and limitations)</i>	
		Formulated	Active	Harvest (days)	Reentry (hours)		
Fall Armyworm (continued)	spinosad O (Entrust) (Tracer)	0.5 to 3.0 oz		28	4	Do not apply more than 3.75 oz of Entrust or 6 oz of Tracer per acre per year.	
	<i>or</i>						
	zeta-cypermethrin R (Mustang Max) <i>or</i>	2.8 to 4.0 oz	0.0175 to 0.025 lb	30 (grain) 60 (silage)	12	Do not apply more than 0.10 lb ai per acre per season, including at-plant plus foliar applications.	
	zeta-cypermethrin + bifenthrin R (Hero)	4.0 to 10.3 oz	0.04 to 0.10 lb	30 (grain) 60 (forage)	12	Do not make applications less than 30 days apart. Do not apply more than 0.40 lb ai per season. Only for use as a foliar application.	
Flea Beetle (Adult)	azadirachtin O (Neemix 4.5)	0.25 to 1.0 pt	NA		12	Use a minimum of 30 gallons of water per acre during application. The compound interferes with an insect's ability to molt and may repel or deter feeding by the insect. May require multiple applications to provide adequate control. Little data on effectiveness on these pests, but it is a natural product.	
	<i>or</i>						
	bifenthrin R (Brigade 2EC) (Discipline 2EC)	2.1 to 6.4 oz	0.033 to 0.10 lb	30	12	Spray in band over small plants.	
	<i>or</i>						
	carbaryl (Sevin)	Many formulations are available. See label for rates and restrictions.					This chemical is relatively safe to handle. The XLR + formulation is resistant to wash off. Do not apply Sevin to wet foliage or when rain or high humidity is expected during the next 2 days.
	<i>or</i>						
	cyfluthrin R (Baythroid 2)	0.8 to 1.6 oz	0.013 to 0.025 lb	21	12	Maximum of four applications per acre per season and 11.2 oz per acre.	
	<i>or</i>						
	chlorpyrifos R (Nufos 4E) (Lorsban 4E) (Yuma 4E)	1 to 2 pt	0.5 to 1.0 lb	35	24	Apply with water sufficient to ensure a minimum spray volume of 20 to 40 gal/A and 40 psi using ground spray equipment.	
	<i>or</i>						
chlorpyrifos + gamma- cyhalothrin R (Cobalt) <i>or</i>	13 to 26 oz	0.25 to 0.51 lb chlorpyrifos 0.005 to 0.009 lb gamma-cyhalothrin	21	24	Can be use pre- or postemergence; see label for further details. Do not allow meat or dairy animals to graze in treated areas or harvest treated corn silage as feed within 14 days of last treatment.		
deltamethrin R (Delta Gold) <i>or</i>	1.0 to 1.5 oz	0.012 to 0.018 lb	21	12	Apply as necessary to maintain control. Do not apply more than 8.1 oz in a growing season.		
esfenvalerate R (Asana XL) <i>or</i>	5.8 to 9.6 oz	0.03 to 0.05 lb	21	12	Use no more than 0.25 lb ai per season.		

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments (read the label for dosage, method, and limitations)
		Formulated	Active	Harvest (days)	Reentry (hours)	
Flea Beetle (Adult) (continued)	gamma-cyhalothrin R (Proaxis)	2.56 to 3.84 oz	0.01 to 0.015 lb	21	12	See label for further limitations.
	<i>or</i>					
	lambda-cyhalothrin R (Warrior and Warrior II) (Taiga Z)	1.28 to 3.84 oz	0.02 to 0.03 lb	21	24	See label for details and restrictions. Warrior II uses half the rate of Warrior.
	<i>or</i>					
	methomyl R (Lannate 90SP) (Lannate LV)	0.25 to 0.50 lb 0.75 to 1.50 pt	0.23 to 0.45 lb	21	48	No more than 2.25 lb ai/crop/season. Apply when insects first appear in significant numbers. This chemical is highly toxic to humans. Lower rates help conserve beneficial arthropods.
	<i>or</i>					
	methyl parathion R (PennCap-M)	2 to 3 pt	0.50 to 0.75 lb	12	5 days	To avoid injuring bees, do not apply dur- ing pollen shed.
	<i>or</i>					
	permethrin R (Artic 3.2EC) (Ambush 25WP) (Pounce 25WP)	4 to 12.8 oz	0.10 to 0.20 lb	30	12	Apply when insect first appears in significant numbers.
	<i>or</i>					
terbufos R (Counter 15G)	6 to 8 oz per 1,000 ft of row	0.75 to 1 lb	30	48	See cutworm insurance treatment.	
<i>or</i>						
zeta-cypermethrin R (Mustang Max)	2.24 to 4.0 oz	0.014 to 0.025 lb	30 (grain) 60 (silage)	12	Do not apply more than 0.10 lb ai per acre per season, including at-plant plus foliar applications.	
<i>or</i>						
zeta-cypermethrin + bifenthrin R (Hero)	2.6 to 6.1 oz	0.025 to 0.06 lb	30 (grain) 60 (forage)	12	Do not make applications less than 30 days apart. Do not apply more than 0.40 lb ai per season. Only for use as a foliar application.	
Seed Treatments						
thiamethoxam (Cruiser 5FS)	0.25 or 1.25 mg per kernel					Not for hopperbox treatment.
<i>or</i>						
clothianidin (Poncho 600)	0.25 or 1.25 mg per kernel					Not for hopperbox treatment.
<i>or</i>						
imidacloprid (Concur) (Latitude)	1.8 oz per 50 lb seed					Used as a planter box treatment. Also contains a fungicide.

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments <i>(read the label for dosage, method, and limitations)</i>
		Formulated	Active	Harvest (days)	Reentry (hours)	
	Flea beetle notes: <ul style="list-style-type: none"> • Treatment is recommended for flea beetles on a rescue basis because of the low probability of problems. Survival of overwintering corn flea beetles is closely tied to the temperature during the winter months. For this reason, they seldom are a problem in Pennsylvania except in a few of the southeastern counties. • If flea beetle has been a continual problem on your farm or in a field, Lorsban 15G, Counter 15G, Counter 20CR, Lorsban 4E, or Phorate 20G or one of the listed seed treatments can be applied at planting as a preventive treatment. • Read the label for specific recommendations and restrictions. 					
Garden Symphylan (Centipede) Threshold: Treat if a significant area of the field is affected.	chlorethoxyfos R (Fortress 5.0G) (Fortress 2.5G)	3.0 to 3.75 oz per 1,000 ft of row 6.0 to 7.5 oz per 1,000 ft of row	0.12 to 0.18 lb	30	48	Recommended as a in-furrow application.
	<i>or</i>					
	chlorpyrifos R (Lorsban 15G)	8 oz per 1,000 ft of row	1 lb	35	12	T-band granulars for best results.
	<i>or</i>					
	(Lorsban 4E) (Nufos 4E) (Yuma 4E)	2 to 4 pt	1 to 2 lb	35	24	Preplant incorporated into the top 2 to 4 inches of soil.
	terbufos R (Counter 15G)	6 to 8 oz per 1,000 ft of row	0.75 to 1 lb	30	48	Place granules in a 7-inch band or, preferably, in-furrow directly behind or in front of planter shoe in front of the press wheel at planting.
Grasshoppers Threshold: 7 or more per square yard in field margins	azadirachtin O (Neemix 4.5)	0.25 to 1.0 pt	NA		12	Use a minimum of 30 gallons of water per acre during application. The compound interferes with an insect's ability to molt and may repel or deter feeding by the insect. May require multiple applications to provide adequate control. Little data on effectiveness on these pests, but it is a natural product.
	<i>or</i>					
	bifenthrin R (Brigade 2EC) (Discipline 2EC)	2.1 to 6.4 oz	0.033 to 0.10 lb	30	12	Direct spray to get through coverage of foliage.
	<i>or</i>					
	carbaryl (Sevin)	Many formulations are available. See label for rates and restrictions.				
	cyfluthrin R (Baythroid 2)	2.1 to 2.8 oz	0.033 to 0.044 lb	21	12	Maximum of four applications per acre per season and 11.2 oz per acre.
	chlorpyrifos R (Lorsban 4E) (Nufos 4E) (Yuma 4E)	0.5 to 1.0 pt	0.25 to 0.50 lb	35	24	Do not apply more than a total of 6 pints per acre per season. Do not allow livestock to graze in treated areas or harvest treated corn silage as feed for meat or dairy animals within 14 days after last treatment.
	<i>or</i>					

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments (read the label for dosage, method, and limitations)
		Formulated	Active	Harvest (days)	Reentry (hours)	
Grasshoppers (continued)	chlorpyrifos + gamma-cyhalothrin R (Cobalt)	7 to 13 oz	0.14 to 0.25 lb chlorpyrifos 0.003-0.005 lb gamma-cyhalothrin	21	24	Do not allow meat or dairy animals to graze in treated areas nor harvest treated corn silage as feed within 14 days of last treatment.
	<i>or</i>					
	deltamethrin R (Delta Gold)	1.0 to 1.5 oz	0.012 to 0.018 lb	21	12	Apply as necessary to maintain control. Do not apply more than 8.1 oz in a growing season.
	<i>or</i>					
	dimethoate	Many formulations are available. See label for rates and restrictions.				
	<i>or</i>					
	esfenvalerate R (Asana XL)	5.8 to 9.6 oz	0.03 to 0.05 lb	21	12	Broadcast over infested area.
	<i>or</i>					
	gamma-cyhalothrin R (Proaxis)	2.56 to 3.84 oz	0.01 to 0.015 lb	21	12	See label for further limitations.
	<i>or</i>					
lambda-cyhalothrin R (Warrior and Warrior II) (Taiga Z)	1.28 to 3.84 oz	0.02 to 0.03 lb	21	24	Timing and frequency of spray should be based on when insect populations reach economic thresholds. See label for details and restrictions. Warrior II uses half the rate of Warrior.	
<i>or</i>						
methyl parathion R (PennCap-M)	2 to 3 pt	0.5 to 0.75 lb	12	5 days	Same restrictions as for aphids.	
<i>or</i>						
zeta-cypermethrin R (Mustang Max)	2.72 to 4.0 oz	0.017 to 0.025 lb	30 (grain) 60 (silage)	12	Do not apply more than 0.20 lb ai per acre per season, including at-plant plus foliar applications.	
<i>or</i>						
zeta-cypermethrin + bifenthrin R (Hero)	2.6 to 6.1 oz	0.025 to 0.06 lb	30 (grain) 60 (forage)	12	Do not make applications less than 30 days apart. Do not apply more than 0.40 lb ai per season. Only for use as a foliar application.	
<i>or</i>						
Hop Vine Borer	gamma-cyhalothrin R (Proaxis)	2.56 to 3.84 oz	0.01 to 0.015 lb	21	12	See label for further limitations.
	<i>or</i>					
	lambda-cyhalothrin R (Warrior and Warrior II) (Taiga Z)	2.56 to 3.84 oz	0.02 to 0.03 lb	21	24	See label for details and restrictions. For control before larvae bore into plant stalk or ear. Warrior II uses half the rate of Warrior.
<i>or</i>						
	permethrin R (Artic 3.2EC) (Ambush 25W) (Pounce 25WP)	4 to 12.8 oz	0.10 to 0.20 lb	30	12	See label for further limitations.
<i>or</i>						

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments <i>(read the label for dosage, method, and limitations)</i>
		Formulated	Active	Harvest (days)	Reentry (hours)	
Hop Vine Borer (continued)	zeta-cypermethrin R (Mustang Max) <i>or</i>	2.72 to 4.0 oz	0.017 to 0.025 lb	30 (grain) 60 (silage)	12	See label for further limitations.
	zeta-cypermethrin + bifenthrin R (Hero)	2.6 to 6.1 oz	0.025 to 0.06 lb	30 (grain) 60 (forage)	12	Do not make applications less than 30 days apart. Do not apply more than 0.40 lb ai per season. Only for use as a foliar application.
Japanese Beetle (Adults)	bifenthrin R (Brigade 2EC) (Discipline 2EC)	2.1 to 6.4 oz	0.033 to 0.10 lb	30	12	Direct spray through coverage of foliage.
Threshold: 3 or more beetles/ear when silks are green	<i>or</i>	Many formulations are available. See label for rates and restrictions.				See label for rates and restrictions. Do not apply when bees are foraging in the field.
	carbaryl (Sevin) <i>or</i>					
	chlorpyrifos + gamma- cyhalothrin R (Cobalt) <i>or</i>	38 to 42 oz	0.74 to 0.82 lb chlorpyrifos 0.013 to 0.015 lb gamma-cyhalothrin	21	24	Do not allow meat or dairy animals to graze in treated areas or harvest treated corn silage as feed within 14 days of last treatment.
	cyfluthrin R (Baythroid 2) <i>or</i>	1.6 to 2.8 oz	0.025 to 0.044 lb	21	12	Maximum of four applications per acre per season and 11.2 oz per acre.
	deltamethrin R (Delta Gold) <i>or</i>	1.5 to 1.9 oz	0.018 to 0.022 lb	21	12	Apply as necessary to maintain control. Do not apply more than 8.1 oz in a growing season.
	esfenvalerate R (Asana XL) <i>or</i>	5.8 to 9.6 oz	0.03 to 0.05 lb	21	12	See label for further limitations.
	gamma-cyhalothrin R (Proaxis) <i>or</i>	2.56 to 3.84 oz	0.01 to 0.015 lb	21	12	See label for further limitations.
	lambda-cyhalothrin R (Warrior and Warrior II) (Taiga Z) <i>or</i>	1.28 to 3.84 oz	0.02 to 0.03 lb	21	24	Do not apply more than 0.06 lb ai per acre after silk initiation. See label for details and restrictions. Warrior II uses half the rate of Warrior.
	methyl parathion R (PennCap-M) <i>or</i>	2 to 3 pt	0.5 to 0.75 lb	12	5 days	Same restrictions as for aphids.
	zeta-cypermethrin R (Mustang Max) <i>or</i>	2.72 to 4.0 oz	0.017 to 0.025 lb	30 (grain) 60 (silage)	12	Do not apply more than 0.10 lb ai per acre per season including at-plant plus foliar applications.
	zeta-cypermethrin + bifenthrin R (Hero)	4.0 to 10.3 oz	0.04 to 0.10 lb	30 (grain) 60 (forage)	12	Do not make applications less than 30 days apart. Do not apply more than 0.40 lb ai per season. Only for use as a foliar application.

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments (read the label for dosage, method, and limitations)
		Formulated	Active	Harvest (days)	Reentry (hours)	
Seedcorn Maggot	If one of the following soil insecticides is used at planting, there is no need to use a seed treatment: Lorsban 15G, Lorsban 4E, Counter 15G or 20CR, Force 3.0G, or Phorate 20G, Fortress 5.0G, Aztec 2.1G, Regent 80WG, or Brigade 2EC. For the soil insecticide to be effective at protecting the seed, part of the product must be applied in the furrow (T-band or in-furrow applications). Otherwise a seed treatment can be used if needed.					
Threshold: None, follow replanting guidelines.	bifenthrin R (Capture LFR) <i>or</i>	4.0 to 5.3 oz	0.047 to 0.062 lb		12	For mixing directly with liquid fertilizer to control soil insect pests. To be preplant incorporated. See label for specific rates.
	chlorpyrifos + gamma-cyhalothrin R (Cobalt)	2.87 oz per 1,000 ft row			24	Use T-band application; see label for more details.
Seed Treatments						
	thiamethoxam (Cruiser 5FS) <i>or</i>	0.25 or 1.25 mg per kernel				Not for hopperbox treatment
	clothianidin (Poncho 600) <i>or</i>	0.25 or 1.25 mg per kernel				Not for hopperbox treatment.
	imidacloprid (Concur) (Latitude)	1.8 oz per 50 lb seed				Used as a planter box treatment. Also contains a fungicide.
Seedcorn maggot notes:						
<ul style="list-style-type: none"> Seedcorn maggot can cause serious injury to both soybean and corn fields. Certain field conditions are more likely to lead to seedcorn maggot problems. If these conditions exist, a seed treatment is relatively inexpensive and a good investment. Fields with heavy applications of manure or high in organic matter are most likely to have serious maggot problems. A planter-box seed treater is suggested for use on seed planted in such fields. Several techniques exist to achieve proper seed coating: <ol style="list-style-type: none"> Fill the planter box with seed, followed by half of the chemical, followed by mixing with a stick (do not use bare hands), followed by the other half of the seed, followed by the remaining chemical and final mixing. Mix the seed and chemical in a separate container (be careful of exposure to the dust). Commercial devices exist that allow addition of the material plus mixing. Although more expensive, an at-planting granular treatment also will control this insect (see Table 2.2-22). 						
Slug	metaldehyde (Deadline M-Ps) (Metarex) (Orcal Snail and Slug Bait)	5 to 40 lb per acre	0.3 lb	0	12	Metaldehyde breaks down to CO ₂ in water. Also registered for use in cereal grains and legumes.
Threshold: 50% of leaf area missing on plants less than V6	Slug notes:					
	<ul style="list-style-type: none"> Slug damage is most severe during cool wet weather, especially in fields under reduced tillage with a fairly heavy cover of organic matter. Corn plants normally recover from slug feeding; however, during periods of prolonged wet weather in May and June, extensive plant mortality may occur. Fields that had heavy damage the previous year may require tillage to break slugs' reproductive cycle. 					

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments (read the label for dosage, method, and limitations)	
		Formulated	Active	Harvest (days)	Reentry (hours)		
Sod Web-worm Threshold: Use those for black cutworm.	azadirachtin O (Neemix 4.5)	0.25 to 1.0 pt	NA		12	Use a minimum of 30 gallons of water per acre during application. The compound interferes with an insect's ability to molt and may repel or deter feeding by the insect. May require multiple applications to provide adequate control. Little data on effectiveness on these pests, but it is a natural product.	
	<i>or</i>						
	<i>Bacillus thuringiensis</i> O	Many formulations are available. See label for rates and restrictions.					These products perform best when larvae are still small and numbers are low to moderate.
	<i>or</i>						
	cyfluthrin R (Baythroid 2)	1.6 to 2.8 oz	0.025 to 0.044 lb	21	12	Maximum of four applications per acre per season and 11.2 oz per acre.	
	<i>or</i>						
	chlorpyrifos R (Lorsban 4E) (Nufos 4E) (Yuma 4E)	1.0 to 2.0 pt	0.50 to 1.0 lb	35	24	Apply as a broadcast spray. Sod webworms typically are a problem only in corn planted in old sod. Shallow incorporation will improve performance.	
	<i>or</i>						
	chlorpyrifos + gamma-cyhalothrin R (Cobalt)	13 to 26 oz	0.25 to 0.51 lb chlorpyrifos 0.005 to 0.009 lb gamma-cyhalothrin	21	2 4	Shallow incorporation is necessary around time of treatment; see label for further details. Do not allow meat or dairy animals to graze in treated areas or harvest treated corn silage as feed within 14 days of last treatment.	
	<i>or</i>						
deltamethrin R (Delta Gold)	1.5 to 1.9 oz	0.018 to 0.022 lb	21	12	Apply as necessary to maintain control. Do not apply more than 8.1 oz in a growing season.		
<i>or</i>							
gamma-cyhalothrin R (Proaxis)	2.56 to 3.84 oz	0.01 to 0.015 lb	21	12	Apply as necessary to maintain control.		
<i>or</i>							
lambda-cyhalothrin R (Warrior and Warrior II) (Taiga Z)	1.28 to 3.84 oz	0.02 to 0.03 lb	21	24	Apply before larva bores into the plant stalk. See label for details and restrictions. Warrior II uses half the rate of Warrior.		
<i>or</i>							
permethrin R (Artic 3.2EC) (Pounce 25WP) (Ambush 25WP)	4 to 12.8 oz	0.10 to 0.20 lb	30	12	Use good integrated pest management practices and apply based on need. Sod webworms typically are a problem only in corn planted in old sod. Same as listed for other corn insects.		
(Pounce 1.5G)	6.7 to 13.3 lb	0.10 to 0.20 lb					
<i>or</i>							
zeta-cypermethrin R (Mustang Max)	2.72 to 4.0 oz	0.017 to 0.025 lb	30 (grain) 60 (silage)	12	Do not apply more than 0.10 lb ai per acre per season, including at-plant plus foliar applications.		

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments <i>(read the label for dosage, method, and limitations)</i>
		Formulated	Active	Harvest (days)	Reentry (hours)	
Stalk Borer Threshold: See the Field Crop IPM Reference and Training Manual.	bifenthrin <i>R</i> (Brigade 2EC) (Discipline 2EC)	2.1 to 6.4 oz	0.033 to 0.10 lb	30	12	Preemergence application after planting. Read the label for other uses as a PRE or PPI application.
	(Capture LFR) <i>or</i>	3.4 oz	0.04 lb		12	For mixing directly with liquid fertilizer to control soil insect pests. To be used preemergence. See label for specific rates.
	cyfluthrin <i>R</i> (Baythroid 2)	1.6 to 2.8 oz	0.025 to 0.044 lb	21	12	Maximum of four applications per acre per season and 11.2 oz per acre.
	<i>or</i>					
	chlorpyrifos <i>R</i> (Nufos 4E) (Lorsban 4E) (Yuma 4E)	2 pt	3.0 lb	35	24	Treat approximately 11 days after application of Roundup or 3 to 5 days after complete burndown with paraquat. Apply as a broadcast spray. Do not use Lorsban in combination with a burn-down herbicide.
	<i>or</i>					
	chlorpyrifos + gamma-cyhalothrin <i>R</i> (Cobalt)	38 to 42 oz	0.74 to 0.82 lb chlorpyrifos 0.013 to 0.015 lb gamma-cyhalothrin	21	24	Do not use in combination with burn-down herbicide, see label for further details. Do not allow meat or dairy animals to graze in treated areas or harvest treated corn silage as feed within 14 days of last treatment.
	<i>or</i>					
	deltamethrin <i>R</i> (Delta Gold)	1.5 to 1.9 oz	0.018 to 0.022 lb	21	12	Apply as necessary to maintain control. Do not apply more than 8.1 oz in a growing season.
	<i>or</i>					
	esfenvalerate <i>R</i> (Asana XL)	5.8 to 9.6 oz	0.03 to 0.05 lb	21	12	Application must be made early in migration from grassy areas to corn, before borers enter the plant. More than one application may be necessary.
	<i>or</i>					
	fipronil <i>R</i> (Regent 4SC)	0.24 oz per 1,000 ft of row	0.13 lb	90	0	This product must be applied using microtube applicators. A good corn root-worm material under most environmental conditions. However, because it has low solubility in water, the product does not work well in dry years.
<i>or</i>						
gamma-cyhalothrin <i>R</i> (Proaxis)	2.56 to 3.84 oz	0.01 to 0.015 lb	21	12	Apply as necessary to maintain control.	
<i>or</i>						
lambda-cyhalothrin <i>R</i> (Warrior and Warrior II) (Taiga Z)	2.56 to 3.84 oz	0.02 to 0.03 lb	21	24	Apply before larva bores into the plant stalk. See label for details and restrictions. Warrior II uses half the rate of Warrior.	
<i>or</i>						
permethrin <i>R</i> (Artic 3.2EC) (Ambush 25W) (Pounce 25WP)	4 to 12.8 oz	0.10 to 0.20 lb	30	12	Use same application timing as for Asana. When treating for stalk borer, apply at or shortly before the larvae are moving into the corn from surrounding weeds and grasses. Mowing or burn-down herbicide can initiate movement.	

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments <i>(read the label for dosage, method, and limitations)</i>
		Formulated	Active	Harvest (days)	Reentry (hours)	
Stalk Borer (continued)	(Pounce 1.5G)	6.7 to 13.3 lb	0.10 to 0.20 lb	30	24	
	<i>or</i>					
	zeta-cypermethrin R (Mustang Max)	2.72 to 4.0 oz	0.017 to 0.025 lb	30 (grain) 60 (silage)	12	Do not apply more than 0.10 lb ai per acre per season, including at-plant plus foliar applications.
	zeta-cypermethrin + bifenthrin R (Hero)	2.6 to 6.1 oz	0.025 to 0.06 lb	30 (grain) 60 (forage)	12	Do not make applications less than 30 days apart. Do not apply more than 0.40 lb ai per season. Only for use as a foliar application.
White Grub Threshold: One or more white grubs per square foot	bifenthrin R (Capture 1.15G) (Empower 2EC)	3.2 to 8.0 oz per 1,000 ft of row	0.002 to 0.006 lb per ft of row	30	24	Apply as a 5- to 7-inch T-band treatment. Do not apply more than 0.1 lb ai per acre per season as an at-plant application. Do not apply more than 0.3 lb ai per acre per season, including at-plant plus foliar applications. Highly toxic to bees.
	(Brigade 2EC) (Discipline 2EC)	0.15 to 0.30 oz per 1,000 ft of row	0.0023 to 0.0046 lb per 1,000 ft of row	30	12	Same as corn rootworm.
	(Capture LFR)	4.0 to 5.3 oz	0.047 to 0.062 lb		12	For mixing directly with liquid fertilizer to control soil insect pests. To be preplant incorporated. See label for specific rates.
	<i>or</i>					
	chlorothoxyfos R (Fortress 5.0G) (Fortress 2.5G)	3 to 7.5 oz per 1,000 ft of row	0.12 to 0.18 lb	30	48	Recommended as a T-band application.
	<i>or</i>					
	cyfluthrin R (Baythroid 2)	0.14 to 0.16 oz per 1,000 of ft row		21	12	Suppression only. Maximum of four applications per acre per season and 11.2 oz per acre.
	<i>or</i>					
	chlorpyrifos R (Lorsban 15G)	8 to 16 oz per 1,000 ft of row	1 to 2 lb	35	12	White grubs seldom are a problem in Pennsylvania corn fields. The pest occurs primarily in corn planted into old bluegrass sod. Before treating specifically for this pest, it is best to scout the field. If other pests are a problem in the field, select a soil insecticide with activity against white grub and the other pest. See label for other uses.
	(Lorsban 4E) (Nufos 4E) (Yuma 4E)	2.4 oz per 1,000 ft of row	1.31 lb	35	24	Incorporate in the top 2 to 4 inches of soil before planting.
<i>or</i>						
chlorpyrifos + gamma- cyhalothrin R (Cobalt)	2.87 oz per 1,000 ft of row			24	Use T-band application; see label for more details.	
<i>or</i>						

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments (read the label for dosage, method, and limitations)
		Formulated	Active	Harvest (days)	Reentry (hours)	
White Grub (continued)	ethoprop R (Mocap 15G)	8.0 oz per 1,000 ft of row	7.0 lb	See label		Suppression only.
	<i>or</i>					
	fipronil R (Regent 4SC)	0.24 oz per 1,000 ft of row	0.13 lb	90	0	This product must be applied using microtube applicators. A good corn rootworm material under most environ- mental conditions. However, because it has low solubility in water, the product does not work well in dry years.
	<i>or</i>					
	gamma-cyhalothrin R (Proaxis)	0.66 oz per 1,000 ft of row	0.0025 lb per 1,000 ft of row	21	12	See label for other limitations and uses.
	<i>or</i>					
	lambda-cyhalothrin R (Warrior and Warrior II) (Taiga Z)	0.33 to 0.66 oz per 1,000 ft of row	0.005 lb per 1,000 ft of row	21	24	See label for details and restrictions. Warrior II uses half the rate of Warrior.
<i>or</i>						
	tebupirimphos R (Aztec 2.1G) (Defcon 2.1G) (Aztec 4.67G)	3.0 to 6.7 oz per 1,000 ft of row	0.12 lb per 1,000 ft of row	30	48	Apply as a T-band or in-furrow. Incor- porated into the soil surface.
<i>or</i>						
	terbufos R (Counter 15G)	6.07 oz per 1,000 ft of row	0.75 lb of row	30	48	Do not exceed 8.7 lb/A.
	tefluthrin R (Force 3.0G)	4 to 5 oz per 1,000 ft of row	0.10 to 0.12 lb	30	0	Apply the granules as an in-furrow treatment. Use 5 oz per 1,000 ft of row for severe infestations.
Seed Treatments						
	thiamethoxam (Cruiser 5FS)	0.25 or 1.25 mg per kernel				Not for hopperbox treatment
<i>or</i>						
	clothianidin (Poncho 600)	0.25 or 1.25 mg per kernel				Not for hopperbox treatment.
<i>or</i>						
	imidacloprid (Concur) (Latitude)	1.8 oz per 50 lb seed				Used as a planter box treatment. Also contains a fungicide.
Wireworm	bifenthrin R (Capture 1.15G) (Empower 2EC)	3.2 to 8.0 oz per 1,000 ft of row	0.002 to 0.006 lb	30	24	Apply in furrow or as a 5 to 7 inch T-band treatment. Do not apply more than 0.1 lb ai per acre per season as an at plant application. Do not apply more than 0.3 lb ai per acre per season in- cluding at plant plus foliar applications.
	(Brigade 2EC) (Discipline 2EC)	0.15 to 0.30 oz per 1,000 ft of row	0.0023 to 0.0046 lb per 1,000 ft of row	30	12	Same as for corn rootworm.

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

Pest	Insecticide	Rate/A		Restrictions		Comments <i>(read the label for dosage, method, and limitations)</i>
		Formulated	Active	Harvest (days)	Reentry (hours)	
Wireworm (continued)	(Capture LFR) <i>or</i>	4.0 to 5.3 oz	0.047-0.062 lb		12	For mixing directly with liquid fertilizer to control soil insect pests. To be preplant incorporated. See label for specific rates.
	chlorothoxyfos R (Fortress 5.0G) (Fortress 2.5G) <i>or</i>	3 to 4.5 oz per 1,000 ft of row 6 to 7.5 oz per 1,000 ft of row	0.12 to 0.18 lb	30	48	Recommended as a T-band application.
	cyfluthrin R (Baythroid) <i>or</i>	0.12 to 0.16 oz per 1,000 ft of row		21	12	See label for other uses and limitations.
	chlorpyrifos R (Lorsban 4E) (Nufos 4E) (Yuma 4E) (Lorsban 15G) <i>or</i>	4 pt per acre 8 oz per 1,000 ft of row	2 lb 1 lb	35 35	24 24	Apply as broadcast spray. Incorporate into the top 2 to 4 inches of soil before planting. At planting time.
	chlorpyrifos + gamma-cyhalothrin R (Cobalt) <i>or</i>	2.87 oz per 1,000 ft of row			24	Use T-band application, see label for more details.
	ethoprop R (Mocap) <i>or</i>	8 oz per 1,000 ft of row	7.0 lb	See label		Apply in a band over a closed seed furrow at planting. Mix granules with top half inch of soil.
	fipronil R (Regent 4SC) <i>or</i>	0.24 oz per 1,000 ft row	0.13 lb	90	0	This product must be applied using microtube applicators. However, because it has low solubility in water, the product does not work well in dry years.
	gamma-cyhalothrin R (Proaxis) <i>or</i>	0.66 oz per 1,000 ft of row	0.0025 lb ai per 1,000 ft of row	21	12	Suppression only.
	lambda-cyhalothrin R (Warrior and Warrior II) (Taiga Z) <i>or</i>	0.33 to 0.66 oz per 1,000 ft of row	0.005 lb ai per 1,000 ft of row	21	24	Apply in furrow or as T-bands. See label for details and restrictions. Warrior II uses half the rate of Warrior.
	permethrin R (Pounce 1.5G) (Artic 3.2EC) (Ambush 25W) (Pounce 25WP) <i>or</i>	8 oz per 1,000 ft of row 0.3 oz per 1,000 ft of row	0.13 lb	30 30	24 24	Should only be considered if heavy infestations are present and corn rootworm is not a concern infield. Apply as an in-furrow or band.

(continued)

Table 2.2-20. Suggested insecticides, rates, and restrictions for corn insects (continued).

<i>Pest</i>	<i>Insecticide</i>	<i>Rate/A</i>		<i>Restrictions</i>		<i>Comments</i> <i>(read the label for dosage, method, and limitations)</i>
		<i>Formulated</i>	<i>Active</i>	<i>Harvest (days)</i>	<i>Reentry (hours)</i>	
Wireworm (continued)	phorate R (Phorate 20G)	6 oz per 1,000 ft of row	1 lb	30	48	Placement same as Lorsban 15G. Do not place Phorate granules in direct contact with seed; use T-band or band application.
	<i>or</i>					
	tebupirimphos R plus cyfluthrin (Aztec 2.1G) (Defcon 2.1G) (Aztec 4.67G)	3.0 to 6.7 oz per 1,000 ft of row	0.12 lb	30	48	Apply as a T-band or in-furrow. Incorporate into the soil surface.
	<i>or</i>					
	tefluthrin R (Force 3.0G)	4 to 5 oz per 1,000 ft of row	0.10 to 0.12 lb	30	0	Apply the granules as an in-furrow treatment. Use 5.0 oz per 1,000 ft of row for severe infestations.
	<i>or</i>					
	terbufos R (Counter 15G)	6 to 8 oz per	0.75 to 1 lb	30	48	Can be applied as 7-inch band, but better control can be achieved by placing the granules in the furrow directly behind the planter shoe.
Seed Treatments						
	thiamethoxam (Cruiser 5FS)	0.25 or 1.25 mg per kernel				Not for planter box treatment
	<i>or</i>					
	clothianidin (Poncho 600)	0.25 or 1.25 mg per kernel				Not for planter box treatment.
	<i>or</i>					
	imidacloprid (Concur) (Latitude)	1.8 oz per 50 lb seed				Used as a planter box treatment. Also contains a fungicide.