

**INSECTICIDE RECOMMENDATIONS FOR POPCORN - 2007**  
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ENT-62

This publication was prepared as a guide for use in the selection of agricultural insecticides. It is not as inclusive as the manufacturer's label. Products listed in bold italics are *Restricted Use* pesticides. **Read and understand the label** before purchasing and using any insecticide. Information on corn insects and their management is available at your county extension office. Several formulations of carbaryl (Sevin) are registered for use on popcorn; however, only the Sevin 80 S is listed.

**Seed Treatments**

Seed treatments are recommended for fields that do not receive a soil insecticide at planting time. Seedcorn maggots can be damaging to fields planted early, especially under reduced tillage practices.

**Treatments for Seed Corn Maggots**

Product	Contents	Use Rate
Agrox Premiere	captan, diazinon, lindane, metalaxyl	2 oz/bu
Diazinon 50% WP	diazinon	½ oz/bu
Germate Plus	Vitavax, diazinon, lindane	1.5 oz/ 42 lbs
Grain Guard Plus	lindane, mancozeb	3 oz/bu
Kernel Guard	captan, diazinon, lindane	2 oz/bu
Kernel Guard Supreme	vitavax, permethrin	1.5 oz/42 lbs

**Soil Insecticides**

**Corn Rootworms**

Corn rootworm larvae are potential pests in fields where field corn, sweet corn or popcorn is grown year after year. If densities of adult western and/or northern corn rootworm beetles exceeded an average of one per plant at any time from July through August and the field is to be planted with any type of corn the following year, an "at-planting" oil insecticide is advisable. See **ENT-45**, Corn Rootworm Beetles for more information.

**Rootworm Insecticides- Liquid Formulations**

Insecticide	Application	Rate
<b><i>Capture LFR</i></b>	5 to 7" T-band over open furrow	0.39 to 0.49 fl oz/1000' of row
<b><i>Capture 2 EC</i></b>	5 to 7" T-band over open furrow	0.3 fl oz/1000' of row
<b><i>Furadan 4 F</i></b>	7" Band or injected	2.5 fl/1,000' row

Liquid insecticides must be compatible with liquid fertilizer when used as tank mixes. Follow label all directions. Follow all precautions when using these products. Liquid formulations are more toxic than granular formulations.

**Rootworm Insecticides- Granular Formulations**

Insecticide	Applications	Ounces/1000' row
<b><i>Aztec 2.1% G</i></b>	Band, T-Band, or furrow	6.7
<b><i>Aztec 4.67% G</i></b>	Band, T-Band, or furrow	3
<b><i>Capture 1.15% G</i></b>	T-Band or furrow	6.4 to 8
<b><i>Counter 20 CR</i></b>	Band or furrow	6
<b><i>Force 3% G</i></b>	Band, T-band or furrow	4-5
<b><i>Fortress 5% G</i></b>	T-band or furrow	3

### Cultivation Applications for Rootworms

A cultivation application may be made if no soil insecticide was applied at planting. Any of the granular insecticides listed above may be used at the indicated rates. *Furadan 4 F* at the rate above or *Lorsban 4E* at 2 pts per acre may be used as basal sprays. These treatments should be applied no later than the last half of May. Moisture following any cultivation is necessary for activation. Treatments will be slow to work or ineffective under very dry conditions. Cultivation treatments should be regarded as delayed applications, **NOT RESCUE** treatments. If significant rootworm damage has already occurred, these delayed applications will not provide effective control.

### White Grubs

White grubs may be abundant in fields following sod or severe grassy weeds in row crops, or where manure has been spread extensively. Several species of white grubs occur in Kentucky and occasionally may damage popcorn roots. A banded application of *Counter 20 CR* at 6 oz per 1000 ft of row is registered for control of white grubs. *Force 1.5% G* and *Force 3% G* are labeled for suppression of white grubs. *Fortress 2.5% G* is labeled at 6 oz per 1000 ft and *Fortress 5% G* at 3 oz per 1000 ft for white grubs. *Capture 2EC* is labeled for white grub control at 0.3 fl oz per 1000 row feet. *Capture 1.15G* is labeled for white grub control at 6.4 to 8 oz per 1000 ft as a T-Band or 3.2 to 8 oz per 1000 feet as a furrow treatment. There are no rescue treatments.

Soil insect pressure can be high in **no-till** popcorn planted directly into ESTABLISHED SOD. *Aztec 2.1 G* is labeled for control of white grubs. Wireworms, white grubs and corn root aphids may be encountered. Use of a soil insecticide is recommended when planting corn directly into sod because of the high probability of damaging populations of soil insects. Best results can be expected when the insecticide is placed directly in the seed furrow. Both the seed and granular insecticide should be covered with soil immediately after application.

### Wireworms

Wireworms are a potential problem where popcorn follows grass or legume-grass sod. Several species can cause economic damage. Wireworms reduce plant populations by attacking the seed or boring into the young plant. The plant will die if the growing point is destroyed. There are no effective rescue treatments once damage is found in the field. Use of a soil insecticide at planting when high wireworm populations exist or a seed treatment with moderate populations are anticipated provide the best means of reducing stand loss.

### Wireworm Insecticides

Insecticide	Application	Ounces/1000' row
<i>Aztec 2.1% G</i>	Band, T-Band or furrow	6.7 oz
<i>Aztec 4.67% G</i>	Band, T-Band, or furrow	3
<i>Capture LFR</i>	5 to 7" T-band over open furrow	0.20 to 0.39 fl oz/1000' of row
<i>Capture 2 EC</i>	5 to 7" T-band over open furrow	0.3 fl oz/1000' of row
<i>Capture 1.15% G</i>	T-band or furrow	3.2 to 8 oz
<i>Counter 15% G</i>	Band or furrow	8 oz
<i>Counter 20% CR</i>	Band or furrow	6 oz
<i>Force 3% G</i>	Band	4 - 5 oz
<i>Fortress 5%G</i>	T-band or furrow	3 oz

### Foliar Insect Pests

Populations of aboveground popcorn insect pests vary from year to year. Weekly field inspections, at least during critical periods of popcorn development, will allow detection of damage and timely application of an insecticide treatment. In general, infestations of these pests can be detected and evaluated by weekly examinations of groups of 20 consecutive plants at random locations within the field. One site for each 10 acres of field size should be adequate. Recording the number of infested plants per location and numbers and size of pests provides invaluable information on which to base control decisions.

## Cutworms

Late planting, moderate to heavy infestations of broadleaf weeds prior to planting, poor field drainage, or an abundance of crop residue, especially soybean straw, are factors that contribute to cutworm problems. Fields with one or more of the risk factors listed above and a history of cutworm problems need to be monitored closely and rescue treatments applied according to economic thresholds or receive a preventive cutworm treatment.

Cutworm monitoring and the use of rescue treatments is recommended as the primary cutworm management strategy, but in the absence of monitoring in fields that are at risk, producers should not leave cutworm management to chance. Rescue treatments can be applied when field inspection indicates that an economic infestation is present. This is the most cost efficient strategy to follow. Frequent field scouting and early detection of the problem is essential. Treat when 3% of the stand is cut and 2 or more larvae (1" or smaller) are found per 100 plants. In fields with a history of serious cutworm problems or in years when cutworm activity is high, fields that have received preventive treatments may need to be scouted and rescue treatments applied.

Control may be unsatisfactory if the soil is dry and crusted and the cutworms are feeding well below the soil surface. Under hot, dry conditions control with some products may be enhanced by cultivation or use of rotary hoe after application. See **ENT-59**, Cutworm Management in Corn, for more information.

### Cutworm Preventive Treatments

Insecticide	Rate	Notes
<i>Asana XL</i>	5.8 to 9.6 fl. oz. per acre	Broadcast
<i>Aztec 2.1% G</i>	6.7 oz. per 1000' of row	Apply as a T-band
<i>Aztec 4.67% G</i>	3 oz per 1000' of row	Apply as a T-band
<i>Capture 2 EC</i>	0.3 fl oz/1000' of row	5 to 7" T-band over open furrow
<i>Capture 1.15% G</i>	T-band	6.4 to 8 oz
<i>Force 3 % G</i>	4 to 5 oz per 1000' of row	May use 3 to 4 oz with T-band or banded applications in 1st year corn only
<i>Mustang Max</i>	0.16 fl oz/1000' row	Apply as band or T-Band
<i>Pounce 1.5 % G</i>	8 ounces per 1000' of row	Apply as T-band or band
<i>Pounce 3.2 EC</i>	4 to 8 fl. oz. per acre	Broadcast or banded sprays
<i>Warrior T</i>	1.92 to 3.2 fl oz per acre	

### Cutworm Rescue Treatments

Insecticide	Rate per Acre	Notes
<i>Asana XL</i>	5.8 to 9.6 fl oz	21 day PHI
<i>Baythroid XL</i>	0.8 to 1.6 fl oz	21 day PHI
<i>Capture 2 EC</i>	2.1 to 6.4 fl oz	30 day PHI
<i>Decis 1.5 EC</i>	1.0 to 1.5 fl oz	21 day PHI
<i>Mustang Max</i>	1.28 to 2.8 fl oz	30 day grain, 60 day silage PHI
<i>Pounce 3.2 EC</i>	4 to 8 fl oz	30 day PHI
<i>Proaxis 0.5 EC</i>	1.92 to 3.2 fl oz	21 day PHI
Sevin 80 S	2-1/2 to 8 lbs	12" band
<i>Warrior T</i>	1.92 to 3.2 fl oz	21 day PHI

### Armyworm / Fall Armyworm

**Armyworm** damage may occur in popcorn shortly after planting into killed sod or small grains. Usually, these insects are present at planting and move to small corn as the cover crop dies. Infestations may be spotty and intense in a field. Control is justified if an average of 2 or more larvae are found on 20% of the plants or 1 larva is found per plant on 50% of the stand. See **ENTFACT-109**, Armyworm in Corn, for more information.

**Fall armyworm** can appear in early July and are most likely to attack late-planted popcorn. Late corn should be watched closely for signs of infestation. Insecticide application by ground rig using at least 30 gallons of water per acre and high pressure will give the best results. Treat whorl stage corn if egg masses are present on 5% or more of the plants or if live larvae are found on 25% or more of the plants. See **ENTFACT-110**, Fall Armyworm in Corn.

#### Foliar Sprays for Armyworm and Fall Armyworm

Insecticide	Rate per Acre	Notes
<i>Asana XL</i>	5.8 to 9.6 fl oz	1 day PHI. True armyworm
<i>Baythroid XL</i>	1.6 to 2.8 fl oz	1st and 2nd instar only, 21 day PHI
<i>Capture 2 EC</i>	2.1 to 6.4 fl oz	30 day PHI
<i>Lannate 90 WSP</i>	1/4 to 1/2 lb	21 day PHI
<i>Mustang Max</i>	3.2 to 4.0 fl oz	30 day grain, 60 day silage PHI
<i>Pennacp-M</i>	2 to 3 pts (true armyworm)	12 day PHI
<i>Pounce 3.2 EC</i>	4 to 8 fl oz	30 day PHI
<i>Proaxis 0.5 CS</i>	2.56 to 3.84 fl oz	21 day PHI
Sevin 80 S	1-1/4 to 2-1/2 lbs	12" band, 14 day PHI
Tracer 4 SC	2 to 3 fl oz	28 day PHI
<i>Warrior T</i>	2.56 to 3.84 fl oz	21 day PHI

#### European Corn Borer

Treatment for FIRST GENERATION European corn bores may be recommended if 25% of the plants show fresh "window pane" feeding damage and live larvae are present. Infestations are generally higher in early-planted popcorn. A computer model accurately predicts when to look for damage. Contact your county extension agent for this information and a copy of **ENT-49**, European Corn Borers in Corn. This publication will allow a more accurate estimate of potential yield loss and will aid in making control decisions.

The SECOND GENERATION of European corn borer is more of a problem for late-planted popcorn. Control with insecticides is difficult because eggs are laid over an extended period. Early harvest is a way to reduce losses due to stalk breakage in fields that are heavily infested.

#### Foliar Treatments for European Corn Borer

Insecticide	Rate/acre	Notes
<i>Asana XL</i>	7.8 to 9.6 fl oz	1 day PHI
<i>Baythroid XL</i>	1.6 to 2.8 fl oz	21 day PHI
Bt products	See Biobit,, Dipel, Javelin, or Lepinox labels for use rates	
<i>Capture 2 EC</i>	2.1 to 6.4 fl oz	30 day PHI
<i>Decis 1.5 EC</i>	1.5 to 1.9 fl oz	21 day PHI
<i>Mustang Max</i>	2.72 to 4.0 fl oz	30 day grain, 60 day silage PHI
<i>Pennacp-M</i>	2 to 4 pts	12 day PHI
<i>Pounce 3.2 EC</i>	4 to 8 fl oz	Apply prior to brown silk
<i>Pounce 1.5% G</i>	6.7 to 13.3 lbs	30 day PHI
<i>Proaxis 0.5 CS</i>	2.56 to 3.84 fl oz	21 day PHI
Sevin 80 S	1-7/8 to 2-1/2 lbs	14 day PHI
Tracer 4 SC	1 to 3 fl oz	28 day PHI
<i>Warrior T</i>	2.56 to 3.84 fl oz	21 day PHI

### Foliar Treatments For Southwestern Corn Borer

Consider control for first generation southwestern corn borer if 35% of the plants show damage and live larvae are till present in the whorls. Corn planted after May 1 has a greater potential for Southwestern corn borer infestation.

Insecticide	Rate/acre	Notes
<i>Asana XL</i>	5.8 to 9.6 fl oz	1 day PHI
<i>Baythroid XL</i>	1.6 to 2.8 fl oz	21 day PHI
Bt products	See Biobit, Dipel, Lepinox and Javelin labels for specific use rates	
<i>Capture 2 EC</i>	2.1 to 6.4 fl oz	30 day PHI
<i>Decis 1.5 EC</i>	1.5 to 1.9 fl oz	21 day PHI
<i>Mustang Max</i>	2.72 to 4.0 fl oz	30 day grain, 60 day silage PHI
<i>PennCap-M</i>	2 to 4 pts	12 day PHI
<i>Pounce 3.2 EC</i>	4 to 8 fl oz	30 days
<i>Pounce 1.5% G</i>	6.7 to 13.3 lbs	30 days
<i>Proaxis 0.5 CS</i>	2.56 to 3.84 fl oz	21 day PHI
Sevin 80 S	1-1/2 to 2-1/2 lbs	14 day PHI
Tracer 4 SC	2 to 3 fl oz	28 day PHI
<i>Warrior T</i>	2.56 to 3.84 fl oz	21 day PHI

### Corn Earworm

**Corn earworm** can be a very serious popcorn pest by eating or damaging kernels at the ear tip. Corn earworm damage to kernels can bring a lower selling price. Earworms only lay eggs on fresh silks. If insecticides are used for earworm control, they should only be applied after tassel emergence and before the silks dry. Pheromone traps can be used to monitor earworm moth activity and predict severity of egg laying.

### Corn Earworm Treatments

Insecticide	Rate per acre	Notes
<i>Asana XL</i>	5.8 to 9.6 fl oz	Rootworm adults, 1 day harvest
<i>Baythroid XL</i>	1.6 to 2.8 fl oz	21 day PHI
Bt Products	See labels for rates	
<i>Capture 2 EC</i>	2.1 to 6.4 fl oz	30 day PHI
<i>Lannate 90 WSP</i>	1/4 to 1/2 lbs	21 day harvest
<i>Mustang Max</i>	1.76 to 4.0 fl oz	30 day grain, 60 day silage PHI
<i>Pounce 3.2 EC</i>	4 to 8 fl oz	Apply prior to brown silk
<i>Proaxis 0.5 CS</i>	1.92 to 3.2 fl oz	21 day PHI
Sevin 80 S	1-1/4 to 2-1/2 lbs	14 day PHI
Tracer 4 SC	2 to 3 fl oz	28 day PHI
<i>Warrior T</i>	1.92 to 3.2 fl oz	21 day PHI

Silk clipping insects may present a problem if damage occurs prior to pollination. Consider treatment if less than 5% of the plants in the field have silked, there are 5 or more rootworm beetles or 2 or more Japanese beetles per ear and silk clipping is occurring. See ID-48, Silk Clipping Insects on Corn, for information on damage and control.

### Foliar Applications to Control Silk Clipping Insects

Insecticide	Rate per acre	Notes
<i>Asana XL</i>	5.8 to 9.6 fl oz	Rootworm adults, 1 day harvest

<i>Baythroid XL</i>	1.6 to 2.8 fl oz	21 day PHI
<i>Capture 2 EC</i>	2.1 to 6.4 fl oz	30 day PHI
<i>Decis 1.5 EC</i>	1.5 to 1.9 fl oz	21 day PHI
<i>Lannate 90 WSP</i>	1/4 to 1/2 lbs	21 day harvest, rootworm adults
<i>Mustang Max</i>	2.72 to 4.0 fl oz	30 day grain, 60 day silage PHI
<i>Pennncap-M</i>	2 to 4 pts (Japanese beetle) 1 to 2 pts (rootworm beetles)	12 day PHI
<i>Pounce 3.2 EC</i>	4 to 8 fl oz	Apply prior to brown silk, 30 day PHI
<i>Proaxis 0.5 CS</i>	2.56 to 3.84 fl oz	21 day PHI
Sevin 80 S	1-1/4 to 2-1/2 lbs	14 day PHI
<i>Warrior T</i>	2.56 to 3.84 fl oz	21 day PHI

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### Occasional Pests

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**Corn leaf aphids** should be monitored prior to tassel emergence and again one week later. Consider treating for corn leaf aphids if an average of 15 or more (10 with stressed plants) per whorl are found 3 weeks before tassel emergence or 30 or more (15 with stressed plants) per whorl 1 week later. In tasseled corn, aphids usually have done their damage and killing them often provides little savings. If less than 50% of pollination has occurred, aphids and honeydew are covering tassels and plants are stressed, an insecticide may be necessary to ensure adequate pollination, but treatments need to be made within 48 hours of tassel emergence. *Asana XL*, *Capture*, *Dimethoate*, or *Lannate* may be used for control.

**Chinch bugs** are small insects with sucking mouthparts that can move from small grain fields or grassy areas into popcorn fields. The small red and white or black and white bugs congregate under the lower leaf sheaths near the base of the stalk. *Asana XL*, *Capture*, *Decis*, *Mustang*, or Sevin may be used for control. Application of a high volume (30 gpa) spray directed at the base of the plants is needed for control. See the product label for rates. From seedling through the 4-leaf stage, an average of 10 bugs per plant can cause wilting or stunting; an average of 20 or more can kill plants.

**Common stalk borers** can be damaging in no-till or reduced tillage popcorn. Control is difficult once the larvae have become established in corn plants. Treatment is most successful when applied just prior to the cutworm rates are labeled for common stalk borer. See **ENTFACT-100**, *Common Stalk Borer in Corn*, for more information.

**Corn flea beetles** overwinter as adults and populations are generally highest following mild winters. Early feeding often occurs during cool weather when corn growth is retarded. *Counter* or *Furadan* at planting will reduce flea beetle injury. *Asana XL*, *Capture*, *Decis*, *Lannate*, *Mustang*, *Pennncap-M*, *Pounce* or Sevin at rates for silk clipping insects (see above) can be used as foliar sprays if feeding damage becomes severe. Corn flea beetles carry the pathogen that causes bacterial leaf blight. Selection of corn varieties resistant to this disease should be considered.

**Corn root aphids** are small (1/16" long) blue-green to gray-green sucking insects that feed on corn roots. Leaves of infested plants will wilt and may turn brown and die. Corn leaf aphids are tended by ants, so ant mounds and activity may be visible on the soil surface. Plants are rarely killed but may be stunted for a time. Damage is most severe under dry soil conditions. There are no rescue treatments. Soil insecticides provide some control when applied at planting.

**Grasshoppers** may become a problem in field corn late in the growing season. Damage is often confined to border rows. No suitable economic thresholds are available. *Asana XL*, *Capture*, *Decis*, *Mustang*, *Pennncap-M* or Sevin may be used as foliar sprays if treatment is needed. See product labels for rates.

**Stink bugs** may be a problem in corn planted under reduced tillage practices following soybeans or small grains. These brown, shield-shaped insects with piercing-sucking mouthparts, feed at the base of corn plants and may cause stunting, tillering or death. Corn is most susceptible to damage from seedling through the 4-leaf stage. Stunted plants usually recover, but yields from stunted plants are reduced by about 60%. *Capture*, *Decis* or *Mustang*

applied at cutworm rates, or **Warrior** at 3.2 to 3.84 fl oz per acre should provide adequate control. See ENTFACT-305, *Stink Bug Damage to Corn*, for more information.

**Webworms** can attack corn following sod. These light-gray, spotted caterpillars insects feed in the same manner as cutworms. They may be found surrounded by a loose silken sack covered with soil particles. The added protection of the sack makes control by contact insecticides more difficult. **Capture**, **Decis** and **Mustang** are specifically labeled for this pest, however, products registered for cutworm control on corn should be effective, also. A basal spray should enhance control.

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#### Products for Control of Insect Pests in Stored Popcorn

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Information in these tables is subject to change at any time. Always check the label of the product to insure that you use it correctly.

##### Empty Bin "Clean Out"

This is an "empty" space fumigation targeted at the space beneath the perforated floor in a metal grain bin. See the **WARNING** below.

(Chlor-o-Pic) 2-4 lb. / 1,000 cubic feet. NOTE: Do **NOT** use to fumigate grain!

Chloropicrin is significantly heavier than air and is therefore preferred for "clean-out" fumigations. However, though it is still labeled for "clean-out" of empty bins, it may not be available due to shipping constraints. Chloropicrin is highly corrosive to most metals.

Aluminum phosphide: tablets 30-140 / 1000 cubic feet. NOTE: applied to a volume not bushels.  
pellets 150-700 / 1000 cubic feet

Aluminum phosphide is not significantly heavier than air and is therefore not the preferred product. However, it is labeled for this use and is easily available. Because of its light and penetrating nature very close attention must be paid to sealing the area to be treated.

##### Bin Surface Applications

Use only in empty bins.

Tempo SC Ultra 0.27 fl oz per 1,000 sq. ft.

##### Grain Protectants

Applied to stored popcorn. If at all possible do not use the same compound to treat both the empty bin and the bulk grain.

##### Amount per 1,000 bushels

Actellic 5E 9.2 - 12.3 fl oz

##### Grain Surface Treatments

For Indian Meal Moth in stored corn.

Actellic 5E	3 fl. oz. in 2 gal water / 1,000 ft sq
Dipel DF	1 lb / 1,000 ft sq (mixed to 4 inch deep)
Biobit HP	1 lb. / 1,000 ft sq (mixed to 4 inch deep)

Note: Indian meal moth adults (IMM) may be controlled by hanging DDVP Resin strips (Vapona) in the head space over the grain mass. Use 1 strip for each 1,000 cubic feet of air space over the grain. One treatment will last about 3 months. Many products with the active ingredient *Bacillus thuringiensis* (B.t.), may be used to control IMM. Dipel and Javelin are just two examples.

Bulk Grain Fumigation

To be applied/1,000 bu stored corn.

Aluminum phosphide      tablets 40-180 / 1,000 bu  
    pellets 200-900 / 1,000 bu

Economic thresholds are hard to determine for stored grain but these numbers should provide a guide to when fumigation will be profitable. Rice weevil or lesser grain borer 1 insect / qt of grain. Red flour beetle, rusty grain beetle and other bran bugs 5 insects / qt of grain. Successful fumigation includes consideration of many variables, use these fumigant amounts as a guide and consult the label of the product you choose.

WARNING: Fumigation is a complicated and dangerous technique. If at all possible hire a commercial fumigator. if a commercial fumigation is not possible consult the label of the product you have chosen to use and follow it to the letter. See Entfact -138 for additional information.

**Information Summary Table for Popcorn Insecticides**

This table is provided for a quick comparison of insecticides labeled on **popcorn**. Insecticides are listed alphabetically by pesticide common name (usually present in the active ingredients section of the product label). One or more brand names are included along with the Restricted Entry Interval (REI) and Mode of Action Group number. Brand names of Restricted Use pesticides appear in *bold italics*.

Use pesticide products only in accordance with their labels and with the Worker Protection Standard. Do not enter or allow worker entry into treated areas during the restricted entry interval. Check the label for Personal Protective Equipment required for early entry to treated areas that is permitted under the Worker Protection Standard and involves contact with anything that has been treated, such as plants, soil, or water.

**Mode of Action Group** A numerical classification system has been developed to make it easy to recognize the modes of action of insecticide products. Insecticides with the same mode of action belong to groups with unique numbers. Selection of a labeled product from a different number category (different mode of action) will help to slow down the development of resistance to either group. For example, alternate use of pyrethroid insecticides and pyrethrins sprays (Category 3) with labeled organophosphate insecticides (Category 1B). Always avoid tank mixing products with the same mode of action. These Mode of Action Group codes are on many pesticide labels and have been developed by the Insecticide Resistance Action Committee (IRAC).

Common Name	Brand Name	Restricted Entry Interval (hours)	Mode of Action Group
bifenthrin	<i>Capture 2 EC</i> <i>Discipline 2 EC</i>	12	3
Bt aizawai	Agree WG, Xentari DF	4	11B1
Bt kurstaki	Biobit, Dipel DF, Javelin WG, Lepinox WDG, etc.	4	11B2
carbaryl	Sevin XLR Plus	12	1A
carbofuran	<i>Furadan 4F</i>	48**	1A
chlorethoxyfos	<i>Fortress 5 G</i>	48	1B
cyfluthrin	<i>Aztec 2.1 or 4.67 G</i> Tempo, <i>Govern</i>	48* NA <sup>‡</sup>	3/1B 3
<i>gamma</i> -Cyhalothrin	<i>Proaxis 0.5 EC</i>	24	3
<i>lambda</i> -Cyhalothrin	<i>Warrior, Mystic Z, Taiga Z</i>	24	3
<i>zeta</i> -Cypermethrin	<i>Mustang Max</i>	12	3
deltamethrin	<i>Decis 1.5 EC</i>	12	3
esfenvalerate	<i>Asana XL</i>	12	3
methyl bromide	<i>Bromo Gas</i>	NA <sup>‡</sup>	8A



methomyl	<i>Lannate</i>	48	1A
methyl parathion	<i>Penncap-M</i>	4 days	1B
permethrin	<i>Pounce EC, Ambush, Arctic</i>	12	3
Pirimiphos-methyl	Storcide II	NA‡	1B
spinosad	Tracer	4	5
tefluthrin	<i>Force 3G</i>	0	3
terbufos	<i>Counter 20 CR</i>	48	1B

NA Not applicable in the usual sense.

\* If the product is soil-injected or soil incorporated, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

\*\* Exceptions apply for corn, sunflowers, and sorghum. See label for details.

‡ For use in storage bins no reentry is allowed. See label for details.

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