INSECTICIDE RECOMMENDATIONS FOR CORN – 2007

ENT-16

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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 corn. Only Sevin 80 S is listed, however, Sevin XLR Plus, or Sevin 4F may be used, if appropriate.

Seed treatments are recommended for fields that do not receive a soil insecticide at planting time. Several commercially applied seed treatments may be ordered on the seed to protect against wireworms, seed corn maggot, and other pests. These include Barracuda (permethrin), Force ST (tefluthrin), Gaucho (imadacloprid), Prescribe (imadacloprid), Poncho (clothianidin), and Cruiser (thiamethoxam). Seedcorn maggots can be damaging to fields planted early, especially under reduced tillage practices.

Treatments for Seed Corn Maggots

	Contents	Use Rate
Agrox Premiere	captan, diazinon, lindane, metalaxyl	2 oz/bu
Concur	imidacloprid, metalaxyl	1.5 oz / 42 lbs
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
KickStart	Vitavax, diazinon, lindane	1.5 oz/42 lbs
Latitude	imidacloprid, carboxin, metalaxyl	1.5 oz / 42 lbs

Pretreatments for Corn Seed (Ordered on the seed)

Commercially Applied Pretreatment	Contents	Target Pests*
Barracuda 25 STD	permethrin	WW, SCM
Cruiser Extreme Pak	thiamethoxam (0.25 mg/ker.)	WW, SCM, FB, WG
Cruiser Extreme Pak BB/CRW	thiamethoxam (1.25 mg/ker.)	WW, SCM, FB, WG, CRW
Force ST	tefluthrin	SCM, CRW, WG, WW
Gaucho	imadacloprid (0.16 mg/ker.)	WW, SCM, FB (through 1st leaf)
Poncho 250	clothianidin (0.25 mg/ker.)	CW, WW, SCM, WG, FB
Poncho 1250	clothianidin (1.25 mg/ker.)	CW, WW, SCM, WG, FB, CRW
Prescribe	imadacloprid (1.34 mg/ker.)	WW, SCM, FB, CRW, CLA, WG

* CLA= corn leaf aphid, CRW= corn rootworm, CW= cutworm, FB= flea beetle, SCM= seedcorn maggot, WG= white grub, WW = wireworm.

Corn Rootworm

These are potential pests in fields where corn 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 to corn the following year, an "at-planting" soil insecticide is advisable. See **ENT-45**, Corn Rootworm Beetles, for more information.

Pounds of granular insecticide needed per acre

% active ingredient	Row width					
	30"	32"	34"	36"	38"	40"
1.5	80.7	8.2	7.7	7.3	6.9	6.5
15	8.7	8.2	7.7	7.3	6.9	6.5
20	6.5	6.1	5.8	5.4	5.2	4.9

Rootworm Insecticides- Granular Applications

Insecticide	Application	Ounces/1,000' row
Aztec 2.1% G	Band, T-Band, or furrow	6.7
Aztec 4.67% G	Band, T-Band, or furrow	3
Counter 20 CR	Band or furrow	6
Force 3% G	Band, T Band or furrow	4-5
Fortress 5% G	T-band or furrow	3
Lorsban 15% G	Band or T band	8
Mocap 10% G	Band	12
Thimet 20% G	Band	6

NOTE: If you plan to use sulfonylurea herbicides, such as ACCENT or BEACON, read the labels of these products carefully before selecting a soil insecticide, especially note the comments regarding Counter. Also, learn the precautions concerning FOLIAR APPLICATIONS of organophosphate insecticides in conjunction with use of these herbicides.

Rootworm Insecticides- Liquid Applications

Insecticide	Application	Rate
Capture LFR	5 to 7" T-band over open furrow	0.39 to 0.49 fl oz/1000' of row
Capture 2 EC	5 to 7" T-band over open furrow	0.3 fl oz/1000' of row
Furadan 4 F	7" Band, Broadcast or Injected	2.5 fl/1,000' of row
Lorsban 4 E	Broadcast PPI	3 qts per acre
Lorsban75 WG	T-band	1.6 oz /1000' of row
Mocap 6 EC	7" Band	1.6 fl oz/1000' of row
Regent 4 SC	Microtube injection or infurrow band	0.24 fl oz/1000' of row

Liquid insecticides must be compatible with liquid fertilizer if applied as tank mixes. *Mocap* is labeled only as a spray with water. Follow label directions carefully. Follow all recommended precautions when using these products. Liquid formulations are **more toxic** than similar granular formulations. Do not plant small grains or other rotational crops within 12 months following a Regent application. **Note: Mocap and Thimet** may cause injury if placed in contact with the seed.

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 4F*** 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.

Wireworms

These can be a potential problem where corn 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. Preplant incorporated applications of liquid formulations of Diazinon, Lorsban or ***Mocap*** are registered for wireworm control in corn. This is economically impractical in most cases. Use of a soil insecticide at planting when high wireworm populations exist or are anticipated or seed treatments with moderate populations provide the best means of reducing stand loss.

Wireworm Insecticides

Insecticides	Application	Ounces/1,000' row
Aztec 2.1% G	Band, T-Band, or furrow	6.7 oz
Aztec 4.67% G	Band, T-Band, or furrow	3 oz
Capture LFR	5 to 7" T-Band over open furrow	0.20 to 0.39 fl oz
Capture 2EC	5 to 7" T-Band over open furrow	0.3 fl oz
Counter 20% CR	Band or furrow	6 oz
Force 3% G	Furrow	4-5 oz
Fortress 5%G	T-band or furrow	3 oz
Lorsban 15% G	Band, T-Band, or furrow	8 oz
Lorsban 4 E	Broadcast PPI	2 qts/acre
Mocap 10% G	Band	12 oz
Regent 4 SC	Microtube injection or infurrow band	0.24 fl oz/1000' row
Thimet 20% G	Band	6 oz

White Grubs

These 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 corn roots. A banded application of ***Counter 20 CR*** is registered for control of white grubs. Lorsban 15G can be used at 8 to 16 oz per 1,000 ft in furrow. Aztec 2.1 G and ***Mocap 15% G*** are labeled for suppression of white grubs. Force 3% G is labeled at 5 oz per 1,000 ft and Force 1.5% G at 10 oz per 1,000 ft for white grubs. ***Fortress 2.5% G*** is labeled at 6 oz per 1000 ft and ***Fortress 5% G*** at 3 oz per 1,000 ft for white grubs***. Regent 4 SC*** is labeled at 0.24 fl oz per 1,000 ft for white grub control (microtube injection or infurrow band). ***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 as an in-furrow application. There are no rescue treatments. Soil insect pressure can be high in no-till corn planted directly into ESTABLISHED SOD. 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.

Foliar Insect Pests

Populations of aboveground corn insect pests vary from year to year. Weekly field inspections, at least during critical periods of corn 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
Asana XL	5.8 to 9.6 fl. oz. per acre	
Aztec 2.1% G	6.7 oz. per 1000' of row	Apply as a T-band
Aztec 4.67% G	3 oz. per 1000' of row	Apply as a T-band
Baythroid 2	0.8 to 1.6 fl oz	grain/fodder 21 days, green 0 day
Capture LFR	0.20 to 0.39 fl oz per 1000' of row	Apply as a T-band
Capture 2 EC	0.3 fl oz per 1000' of row	Apply as a T-band
Capture 1.15% G	6.4 to 8 oz per 1000' of row	Apply as a T-band
Capture 1.15% G	3.2 to 8oz per 1000' of row	Apply in-furrow
Force 3 % G	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
Lorsban 15 % G	8 oz per 1000' or row	Apply as T-band or band
Lorsban 4 E	2 to 4 pints per acre	Preplant incorporation
Lorsban 4 E	2.4 fl. oz. per 1000' of row	Apply as T-band in front of press wheel
Lorsban 75 WG	1.6 oz. per 1000' of row	Apply as T-band
Mustang Max	0.16 fl oz per 1000' of row	Banded or T-band
Pounce 1.5 % G	8 ounces per 1000' of row	Apply as T-band or band
Pounce 3.2 EC	4 to 8 fl. oz. per acre	Broadcast or banded sprays
Proaxis 0.5 EC	1.92 to 3.2 fl oz per acre	
Warrior T	1.92 to 3.2 fl. oz. per acre	

Cutworm Rescue Treatments

Insecticide	Rate per Acre	Notes
Asana XL	5.8 to 9.6 fl oz	21 day PHI
Baythroid XL	0.8 to 1.6 fl oz	Grain/fodder 21 days, green 0 days
Baythroid 2	0.8 to 1.6 fl oz	Grain/fodder 21 days, green 0 days
Capture 2 EC	2.1 to 6.4.fl oz	30 day PHI
Decis 1.5 EC	1.0 to 1.5 fl oz	21 day PHI
Lorsban 4 E	1 to 2 pts	35 day fodder interval
Lorsban 75 WG	0.67 to 1.33 lb	35 day PHI
Mustang Max	1.28 to 2.8 fl oz	30 day grain, 60 day silage PHI
Penncap-M 2FM	4 pts	Ground only, 12 day PHI
Pounce 3.2 EC	4 to 8 fl oz	30 day PHI
Sevin 80 S	2-1/2 lbs	12″ band

Proaxis 0.5 EC	1.92 to 3.2 fl. oz.	21 day PHI
Warrior T	1.92 to 3.2 fl oz	21 day PHI

Armyworm

Armyworm damage may occur in corn shortly after planting into killed sod or small grains. Usually, these insects are present at planting and mover to small corn as the cover crop dies. Infestations may be spotty and intense. Control is justified if an average of 2 or more larvae are found on 25-30% of the plants or 1 larva is found per plant on 75% of the stand. See **ENFACT-109**, Armyworms in Corn, for more information.

Fall Armyworm

Fall armyworm can appear in early July and are more likely to attack late-planted corn. 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, for more information.

Foliar Applications for Armyworm and Fall Armyworm

Insecticide	Rate per Acre	Notes
Asana XL	5.8 to 9.6 fl oz	True armyworm, 21 day PHI
Baythroid XL	1.6 to 2.8 fl oz	grain/fodder 21 days, green 0 day
Baythroid 2	1.6 to 2.8 fl oz	grain/fodder 21 days, green 0 day
Capture 2 EC	2.1 to 6.4 fl oz	30 day PHI
Capture 1.15% G	3.4 to 8.7 lbs	30 day PHI
Intrepid 2F	4 to 8 fl oz	True armyworm, 21 day PHI
Lannate 90 WSP	1/4 to ½ lb	21 day PHI, 3 forage, 21 fodder
Lorsban 4 E	1 to 2 pts	See cutworm notes
Lorsban 75 WG	0.67 to 1.33 lb	35 day PHI
Malathion 57% EC	1-1/2 to 2 pts	5 day PHI
Mustang Max	3.2 to 4.0 fl oz	30 day grain, 60 day silage PHI
Penncap-M 2 FM	4 pts	Ground only, 12 day PHI
Pounce 3.2 EC	4 to 8 fl oz	30 day PHI
Proaxis 0.5 CS	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 day PHI
Tracer 4 SC	2 to 3 fl oz	28 day PHI
Warrior T	2.56 to 3.84 fl oz	21day PHI

European Corn Borer and Southwestern Corn Borer

Treatment for FIRST GENERATION European corn borers may be recommended if 50% of the plants show fresh "window pane" feeding damage and live larvae are present. Infestations are generally higher in early planted corn. 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.

Regent 4 SC applied for rootworm control at planting will also aid control of first generation European corn borer.

The SECOND GENERATION of European corn borer is usually only a problem for late-planted corn. Control with insecticides can be difficult because the second generation is poorly synchronized. Early harvest is a way to reduce losses due to stalk breakage in fields that are heavily infested.

Controls should be considered for first generation southwestern corn borer if 35% of the plants show damage and Southwestern corn borer larvae are still present in the whorls. Corn planted after May 1 has a greater potential for Southwestern corn borer infestation.

Several types of corn hybrids have been genetically engineered to produce the *Bacillus thuringiensis* (Bt) delta endotoxin. In effect, these hybrids produce their own insecticide. Different hybrids may produce different selective insecticides. Be sure to correctly match the type of Bt-hybrid with the pest that needs to be controlled.

Bt-corn Technology Available for Commercial Use

Event	***Company***	***Bt gene***	***Trade name***	***Pests controlled or suppressed***
Bt 11	Northrup King (Novartis)	CryIA(b)	YieldGard	European and southwestern corn borers, fall armyworm, and corn earworm
MON 810	Monsanto[1]	CryIA(b)	YieldGard	European and southwestern corn borers, fall armyworm, and corn earworm
TC1507	DowAgrosciences, Mycogen, Pioneer Hi-Bred Intl.	CryIF	Herculex I	European and southwestern corn borers, black cutworm, fall armyworm, and corn earworm
MON 863	Monsanto[1]	Cry3Bb1	YieldGard Rootworm	Corn rootworms
MON 863 + Mon 810	Monsanto[1]	CryIA(b) + Cry3Bb1	YieldGard Plus	European and southwestern corn borers and corn rootworms
DAS 59122-7	Dow Agrosciences Pioneer Hi-Bred Intl	Cry34Ab1 + Cry35Ab1	Herculex RW	Corn rootworms
TC1507 + DAS 59122-7	Dow Agrosciences Mycogen Pioneer Hi-Bred Intl	CryIF + Cry34Ab1 + Cry35Ab1	Herculex XTRA	European and southwestern corn borers, black cutworm, fall armyworm, corn earworm, and corn rootworms

[1] Monsanto has licensed the use of their YieldGard technology to many seed companies.

Growers using these hybrids still need to monitor their fields regularly for non-Lepidopteran pests (such as corn leaf aphids, and western and northern corn rootworms) and some Lepidopteran pests including armyworm, cutworms, and fall armyworm that are not controlled by these new hybrids.

Resistance Management and Bt Corn

A major concern with the use of these new hybrids is the development of Bt-resistance. The potential for European corn borer populations developing tolerance or becoming resistant to Bt increases as Bt-corn acreage increases. Growers need to prevent resistance rather than try and fight it once it becomes a problem. The EPA, Land Grant Universities, and industry have developed an effective resistance management plan that must be followed by all growers using Bt corn. The primary method to prevent or delay insect resistant is to always plant a corn borer refuge. A refuge means that at least 20% of your corn acreage is planted with non-Bt hybrids. This will provide a place for the Bt-susceptible corn borers to develop. The refuge must be within 1/4 to 1/2 mile of the Bt corn. Each farm using Bt corn must have their own refuge on that farm.

Foliar Treatments for European Corn Borer

Insecticide	**Rate/acre**	**Notes**
Asana XL	7.8 to 9.6 fl oz	21 day PHI
Baythroid XL	1.6 to 2. 8 fl oz	grain/fodder 21 days, green 0 day
Baythroid 2	1.6 to 2. 8 fl oz	grain/fodder 21 days, green 0 day
Bt products	See labels for specific use rates	
Capture 2 EC	2.1 to 6.4 fl oz	30 day PHI
Capture 1.15G	3.5 to 8.7 lb	30 day PHI

Decis 1.5 EC	1.5 to 1.9 fl oz	21 day PHI
Furadan 4 F	1-1/2 to 2 pts	30 day PHI
Intrepid 2 F	4 to 8 fl oz	21 day PHI
Lorsban 15% G	5 to 6.5 lbs	35 day PHI; 14 day fodder
Lorsban 4 E	1.5 to 2 pts	35 day PHI; 14 day fodder
Lorsban 75 WG	0.67 to 1.33 lb	35 day PHI
Mustang Max	2.72 to 4.0 fl oz	30 day grain, 60 day silage PHI
Penncap-M 2 FM	2 to 4 pts	Ground only, 12 day PHI
Pounce 3.2 EC	4 to 8 fl oz	30 day PHI
Pounce 1.5% G	6.7 to 13.3 lbs	30 day PHI
Proaxis 0.5 EC	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
Warrior T	2.56 to 3.84 fl oz	21 day PHI

Foliar Treatments for Southwestern Corn Borer

Insecticide	Rate/acre	Notes
Asana XL	5.8 to 9.6 fl oz	21 day PHI
Baythroid XL	1.6 to 2. 8 fl oz	grain/fodder 21 days, green 0 day
Baythroid 2	1.6 to 2.8 fl oz	grain/fodder 21 days, green 0 day
Bt products	See labels for specific use rates	
Capture 2 EC	2.1 to 6.4 fl oz	30 day PHI
Capture 1.15G	3.5 to 8.7 lb	30 day PHI
Decis 1.5 EC	1.5 to 1.9 fl oz	21 day PHI
Furadan 4 F	1 to 2 pts	30 day PHI
Intrepid 2 F	4 to 8 fl oz	21 day PHI
Lorsban 15% G	5 to 6.5 lbs	35 day PHI; 14 day fodder
Lorsban 4 E	1.5 to 2 pts	35 day PHI; 14 day fodder
Lorsban 75 WG	1.0 to 1.33 lb	35 day PHI
Mustang Max	2.72 to 4.0 fl oz	30 day grain, 60 day silage PHI
Penncap-M 2 FM	2 to 4 pts	Ground only, 12 day PHI
Pounce 3.2 EC	4 to 8 fl oz	30 day PHI
Pounce 1.5% G	6.7 to 13.3 lbs	30 day PHI
Proaxis 0.5 EC	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
Warrior T	2.56 to 3.84 fl oz	21day PHI

Occasional pests

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 100 or more per plant on 50 percent or more of the plants. On 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, Lannate, Lorsban***, or Malathion may be used for control.

Chinch bugs are small insects with sucking mouthparts that can move from small grain fields or grassy areas into corn. The small red and white or black and white bugs congregate under the lower leaf sheaths near the base of the stalk. ***Asana XL, Baythroid, Capture, Decis, Lorsban, Mustang***, or Sevin may be used for control. Application of a high gallonage (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 notill or reduced tillage corn. Control is difficult once the larvae have become established in corn plants. Treatment is most successful when applied just prior to the borers entering the plants. Most insecticides labeled for cutworm control are labeled for stalk borer. See **ENTFACT-100**, *The Common Stalk Borer in Corn* for more information.

Corn earworms may be found feeding on ear tips of field corn. Repeated insecticide applications are needed to significantly reduce infestations because moths lay eggs over an extended period of time. Control attempts cannot be economically justified. Corn earworms can be found feeding in the whorl but will not cause significant injury.

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, Baythroid, Capture, Decis, Lannate, Lorsban, Mustang, Penncap-M, Pounce,*** Sevin or ***Warrior*** can be used as foliar sprays if feeding damage becomes severe. Corn flea beetles can 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) bluegreen to graygreen sucking insects that feed on corn roots. Leaves of infested plants will wilt and may turn brown and die. These aphids are tended by ants. Ant mounds and ant activity may be visible on the soil surface. Plants can be killed or stunted. Damage is most severe under dry soil conditions. There are no rescue treatments. Soil insecticides and tillage will provide some control.

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, Baythroid, Capture, Decis, Lorsban, Mustang,*** Malathion, ***Penncap M,*** or Sevin may be used as foliar sprays if treatment is needed. See product labels for rates.

Silk clipping insects may present a problem if damage occurs prior to pollination. Consider treatment if less than 75% 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. ***Asana XL, Baythroid, Capture, Lannate, Lorsban, Mustang,*** Malathion, ***Penncap-M, Pounce***, Sevin or ***Warrior*** can be used to control silk slipping insects.

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%. ***Baythroid, Capture, Decis, Lorsban, Mustang, or Penncap-M*** 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 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, Lorsban, Mustang,*** and ***Warrior*** are specifically labeled for this pest, however, products registered for cutworm control on corn should be effective. A basal spray should enhance control.

Products for Control of Insect Pests in Stored Field Corn

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-Picn 2-4 lb./1000 cubic feet. NOTE: Do **NOT** use to fumigate grain!

Chloropicrin is significantly heavier than air and is therefore preferred for "clean-out" fumigations. However, thought 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 there for not the preferred product. However, it is labeled for this use and is easily available. Because of it's light and penetrating nature very close attention must be paid to sealing the area to be treated.

in Surface Applications

Use only in empty bins.

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

Grain Protectants

Applied to stored corn. 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 Fumigantion

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 Corn Insecticides

This table is provided for a quick comparison of insecticides labeled on **corn**. 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
aluminum phosphide	***Phostoxin, Fumtoxin***	NA‡	8D
bifenthrin	***Capture 2 EC*** ***Discipline 2 EC***	12	3
Bt aizawai	Agree WG, Xentari DF	4	11B1
Bt kurstaki Bt kurstaki	Biobti, Dipel DF, Javelin WG, Lepinox WDG, etc.	4	11B2
carbaryl	Sevin XLR Plus	12	1A
carbofuran	***Furadan 4F***	48**	1A
chlorethoxyfos	***Fortress 5 G***	48	1B
chloropicrin	***Chlor-O-Pic***	NA‡	NA
chlorpyrifos	***Lorsban 4E, Warhawk, Whirlwind, Yuma*** Lorsban 15 G	24 24*	1B 1B
cyfluthrin	***Aztec 2.1 or 4.67 G*** ***Baythroid 2, Govern*** Tempo	48* 12 NA‡	3/1B 3 3
gamma-Cyhalothrin	***Proaxis 0.5 EC***	24	3
lambda-Cyhalothrin	***Warrior, Mistic Z,*** ***Taiga Z***	24	3
zeta-Cypermethrin	***Mustang Max, Mustang***	12	3
deltamethrin	***Decis 1.5 EC***	12	3
dimethoate	Cygon 400	48	1B
esfenvalerate	***Asana XL***	12	3
ethoprop	***Mocap 15G***	48*	1B
fipronil	***Regent 4SC***	0	2B
malathion	Cythion, Malathion	12	1B
methyl bromide	***Bromo Gas***	NA‡	8A
methomyl	***Lannate***	48	1A
methoxyfenozide	Intrepid 2F	4	18
methyl parathion	***Penncap-M***	4 days	1B
permethrin	***Pounce EC, Ambush, Arctic***	12	3
phorate	***Thimet 20 G***	48	1B
pirimiphos-methyl	Actellic	NA‡	1B
spinosad	Tracer	4	5
spiromesifen	Oberon	12	23

tefluthrin	***Force 3G***	0	3
terbufos	***Counter 20 CR***	48	1B
thiocarb	***Larvin 3.2 AF***	48	1A

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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