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Insecticide Suggestions To Control Insect Pests Of Field Crops In 1976

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AGRICULTURAL EXTENSION SERVICE
UNIVERSITY OF MINNESOTA

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Insecticide Suggestions To Control Insect Pests Of Field Crops In 1976

Aldrin, DDT, dieldrin, endrin, heptachlor, lindane, and TDE (DDD) are classified as restricted use pesticides in Minnesota. Dealers must be licensed to sell these products. Licenses are available from the Minnesota Department of Agriculture. Formulations containing these pesticides can be used only for purposes specified by the Department of Agriculture. Aldrin and dieldrin registrations have been cancelled by the U.S. Environmental Protection Agency. Chlor-dane and heptachlor are involved in suspension and cancellation hearings by the EPA.

To help prevent illegal residues in livestock products it is suggested that the above-mentioned pesticides not to be used for any purpose, except seed treatment, on dairy farms. If these pesticides are used as soil treatments on corn the crop should be harvested for grain only and dairy cattle or meat animals being finished for slaughter should not be allowed to graze in treated fields. Dairymen, poultry producers and feeders should also be sure that purchased hay or other feed does not contain illegal residues.

Illegal residues may also occur in root crops (potatoes, sugar beets, carrots, etc.) and in soybeans and alfalfa grown in fields previously treated with these chemicals.

The suggestions in this publication include only the use of insecticides for controlling insect pests of field crops.

Other practices—such as crop rotation, time of planting, and appropriate selection of varieties—should also be considered. In most situations, the use of insecticides is only part of a total effort to keep insect pests below the economic injury level.

Where information is available, economic thresholds have been indicated in this publication. These are general guidelines that will vary, depending on stage of development of the crop, growing conditions, value of the crop, and other factors.

Carbaryl (Sevin), ULV malathion and parathion are very toxic to bees. Crops in bloom should not be treated and applications should not be made near bee yards or when bees are present in the field to be treated.

Aldicarb (Temik), demeton (Systox), disulfoton (Di-Syston), mevinphos (Phosdrin), methyl parathion, parathion, phorate (Thimet), and phosphamidon (Dimecron) are **highly toxic** chemicals and should be used only by persons acquainted with the necessary precautions for their safe use. The granular formulations are less hazardous to the operator than are the liquids. Avoid inhalation of dusts or vapors and contact with the skin. Follow directions on the labels for the use of protective clothing and other safety measures.

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Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Roland H. Abraham, Director of Agricultural Extension Service, University of Minnesota, St. Paul, Minnesota 55108. We offer our programs and facilities to all people without regard to race, creed, color, sex, or national origin.

Crop	Insect	Insecticide	Dosage	Limitations, remarks (Days before harvest)	
Alfalfa, clover	Alfalfa weevil	azinphosmethyl (Guthion)	½ — ¾ lb.	21 days, one application per cutting	
		carbofuran (Furadan)	¼ — ½ lb.	7 days ¼ lb., 14 days ½ lb.	
		methyl parathion	¼ lb.	15 days	
		Imidan	1 lb.	7 days, one application per cutting	
		diazinon plus methoxychlor	½ lb. + 1 lb.	10 days — available as a ready-to-use mixture	
		malathion plus methoxychlor	¾ lb. + ¾ lb.	10 days — available as a ready-to-use mixture	
		Supracide	½ lb.	10 days	
	Cut first crop early to avoid most losses. Treat when over 30% of plant tips show feeding. Treat stubble if there are more than 8 larvae per sq. ft. or when regrowth has 50% of the terminals with feeding or if larvae are delaying regrowth.				
	Aphids, leafhoppers	diazinon	½ lb.	7 days	
		dimethoate (Cygon, De-Fend, Rebe-late, Dimex 267)	¼ — ½ lb.	10 days	
		malathion	1 lb.	No time limitations	
		parathion	¼ lb.	15 days	
	Control aphids when thick enough to cause wilting, usually during drought. Spotted alfalfa aphids may severely damage new seedlings.				
	Armyworm, cutworms	carbaryl (Sevin)	1½ lb.	No time limitations, spray or bait	
		malathion	1 lb. (or ULV)	No time limitation:	
		trichlorfon (Dylox)	1 lb. spray or bait	7 days — 1 lb. 14 days — bait	
	Treat when over 5 per sq. ft.				
	Leafhoppers	azinphosmethyl	¼ to ½ lb.	14 days	
		carbaryl	1 lb.	No time limitations	
		diazinon	½ lb.	7 days	
		methoxychlor	1 lb.	7 days	
malathion		1 lb.	No time limitations		
Apply when regrowth after first cutting is 8 to 12 inches and leafhoppers are over 2 per net sweep. Combinations of methoxychlor with diazinon or malathion are also available.					
Grasshoppers	azinphosmethyl	½ to ¾ lb.	21 days		
	carbaryl	1 to 1½ lb.	No limitations		
	carbofuran	½ lb.	7 days, one application per season.		
	diazinon	½ lb.	7 days		
	malathion	1½ lb. or ½ lb. technical as ULV	5 days, ULV No time limitations		
Control when there are over 8 grasshoppers per sq. yd. in the field or treat margins after cutting at more than 20 per sq. yd.					
Spittlebug	methoxychlor	1 lb.	7 days		
Apply on first crop when spittle masses average more than one per stem.					
Plant bugs	malathion + methoxychlor	¾ lb. + ¾ lb.	7 days		
	trichlorfon	1 lb.	7 days		
	diazinon + methoxychlor	½ lb. + 1 lb.	7 days		
	Control seldom needed except on seed crop. Cut early to avoid injury.				
Alfalfa, clover (for seed only)	Plant bugs	endosulfan (Thiodan)	1 lb.	Do not harvest for forage or graze.	
		toxaphene	2 lb.	Do not treat crop in bloom.	

Crop	Insect	Insecticide	Dosage	Limitations, remarks (Days before harvest)	
Corn, field	Aphids	malathion	1 lb.	5 days	
		methyl parathion	4 oz.	12 days } Aerial application only	
		parathion	4 oz.		
		phorate (Thimet)	1 lb.	Granules applied in the whorl just before tasselling.	
		disulfoton (Di Syston)	1 lb.	Granules 40 days	
			disulfoton	½ lb.	Spray 28 days.
		Chemical control of cornleaf aphids is seldom economically justified. If 10% of the plants have over 500 aphids per plant prior to tasselling during drought stress treatment may pay.			
	Armyworm	carbaryl (Sevin)	1½ to 2 lb.	No limitations	
		malathion	1 to 1½ lb.	5 days	
		toxaphene	2 lb.	Do not feed stalks, leaves, or husks. No limitation for grain.	
trichlorfon		1 lb.	No limitations		
Treat when over 10% of the plants are infested. Higher rates for large worms.					
Corn	Corn rootworm larvae	carbofuran (Furadan)	1 lb.	Planting time application of granules in 7-inch band over the row. Do not place in direct contact with the seed. Band of granules should be covered lightly. Some liquid formulations are registered. Cultivation time applications of materials registered for such use may be made after rootworm eggs hatch in June. Apply at base of stalks and cover with soil. This method is not effective during dry conditions. Rates given are for 40-inch row spacing or for 13,200 ft. of row.	
		Counter	1 lb.		
		Dasanit	1 lb.		
		Dyfonate	1 lb.		
		Lorsban	1 lb.		
		Mocap	1 lb.		
		phorate (Thimet)	1 lb.		
	Rootworm control using chemicals may not be satisfactory in conditions of heavy infestation. In such situations, it is best to rotate to a crop other than corn.				
	Corn rootworm adults	carbaryl	1 lb.	No time limitations. ULV or dilute	
		diazinon	1 lb.	No time limitations	
malathion		1 lb.	5 days		
malathion ULV		4 to 8 oz. as technical by air	5 days		
EPN		¼ — ½ lb.	14 days		
Treat when beetles reach 10 per plant when pollen and fresh silks are present.					
Cutworms	chlordane**	4 lb.	} Apply broadcast and disk in before planting.		
	heptachlor**	2 lb.			
	diazinon	1 to 2 lb.	Apply in 7-inch band as for rootworms at planting time.		

* Restricted use pesticides, check legal status before use.

** The EPA has announced intent to cancel registration, check legal status before use.

Crop	Insect	Insecticide	Dosage	Limitations, remarks (Days before harvest)	
Corn	Cutworms, webworms	carbaryl	1 to 2 lb.	Post emergence spray to cover approximately 12-inch band at base of plants in at least 15 gal. total spray per acre. Limitations same as for armyworm. Carbaryl bait is more effective than sprays for cutworms.	
		trichlorfon (Dylox)	1 lb.		
		toxaphene	2 lb.		
	Apply when over 10% of the plants are infested.				
	European corn borer	carbaryl	1½ lb.	Spray or granules, no time limitations.	
		carbofuran	1 lb.	Granules. No more than 2 applications.	
		diazinon	1 lb.	Granules. No time limitations.	
		Dyfonate	1 lb.	Granules. 45 days.	
		EPN	½ lb.	As spray or granules, 14 days.	
		phorate	1 lb.	As granules.	
		toxaphene	2 lb.	As granules. Use on corn for grain only.	
	Treat when 50% of whorl leaves show shot-holing for first brood.				
	Grasshoppers	carbaryl	1½ lb.	No time limitations.	
		diazinon	½ lb.	No time limitations.	
		malathion	1 lb. or ½ lb. technical as ULV	5 days	
		toxaphene	1½ lb.	For grain only, no time limitations.	
		Treat field margins early when grasshoppers are small.			
	Seed-corn maggot, seed-corn beetle, wireworms	heptachlor**, lindane*, or diazinon	1 oz. per bu.	Seed treatment only. Will not control heavy wireworm infestations.	
	Wireworms, white grubs, webworms, Seed-corn maggots, seed-corn beetles	chlordane**	4 lb.	Broadcast application disked in before planting. A row treatment at half the indicated rate applied at planting time may be used.	
		heptachlor**	2 lb.		
Seed-corn maggots, beetles	Dasanit	1 lb.	Band in row at planting time as for rootworm.		
Wireworm	Dyfonate	1 lb.			
	Mocap	1 lb.	As for rootworm.		
	phorate	1 lb.	As for rootworm.		
	diazinon	4 lb. }	Broadcast, disc in before planting.		
	Dyfonate	4 lb. }			
Small grains	Aphids	malathion	1 lb.	No limitations. 15 days 30 days. For wheat only. Do not graze. Treatment most economical before heading with over 100 aphids per ft. of row.	
		methyl parathion	4 oz.		
		parathion	4 oz.		
		disulfoton	¼ to ¾ lb.		
	Armyworm, cutworms	malathion	1½ lb.	7 days	
		toxaphene	2 lb.	Use for grain only.	
		Treat when number of worms exceeds 5 per sq. ft.			
	Grasshoppers	malathion	1 lb. or ½ lb. as technical by air	7 days	

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Crop	Insect	Insecticide	Dosage	Limitations, remarks (Days before harvest)	
Small grains	Grasshopper	toxaphene	1½ lb.	Use for grain only. Treat when over 8 per sq. yd. in field or over 30 in margins.	
	Wireworms	heptachlor** or lindane*	1 oz. per bu.	Seed treatment only.	
Barley	Thrips	parathion or methyl parathion by air	6 oz.	15 days. Apply just at heading when there are 4 or more adult thrips per plant.	
Flax	Cutworms, crickets	chlordan** trichlorfon	1 to 1½ lb. 1 lb.	Do not apply after blossoms appear. 21 days	
Soybeans	Bean leaf beetle, flea beetles, blister beetles	carbaryl (Sevin)	1 lb.	No limitations. Treat when defoliation exceeds 25% during pod fill or seedling stage or when pod feeding is extensive.	
		Cutworms, Armyworms	carbaryl toxaphene	1½ lb. 1½ lb.	No limitations. 21 days. Do not feed treated plants.
	Grasshoppers	carbaryl	1½ lb.	No limitations.	
		malathion	½ lb. technical as ULV by air	7 days	
	Green cloverworm	toxaphene	1½ lb.	21 days. Do not feed treated plants.	
		azinphosmethyl Bacillus thuringiensis (Dipel, Thuricide)	6 to 8 oz.	45 days. As labeled:	
		carbaryl	1 lb.	No limitations.	
		malathion	1 lb.	7 days	
	Treat when defoliation exceeds 25% or when worms number more than 15 per foot of row during pod fill.				
	Leafhoppers	malathion	1 lb.	7 days	
Sugar beets	Webworm	carbaryl (Sevin)	1½ lb.	14 days, tops.	
		endosulfan (Thiodan)	1 lb.	Do not feed tops.	
		parathion	4 to 8 oz.	15 days	
		trichlorfon (Dylox)	1 lb.	14 days, beets 28 days, tops	
	Treat when worms exceed 5 per sq. ft.				
	Cutworms	carbaryl	2 lb. spray 1 to 2 lb. bait	14 days, tops. Bait formulation preferred.	
		trichlorfon	1 lb.	14 days, beets 28 days, tops	
	Root maggots	aldicarb (Temik)	1½ lb.	Row treatment at seeding time. Place granules above seed in 5 to 7 inch band or as furrow treatment above seed. Some products may also be sidedressed at time of fly emergence. Check labels.	
		carbofuran	2 lb.		
		Dasanit	1 to 2 lb.		
diazinon		2 lb.			
disulfoton (Di-Syston)		1 lb.			
Dyfonate		1 lb.			
Wireworms	phorate (Thimet)	1 lb.	Seed treatment only.		
	lindane*	1 oz. per bu.			

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Crop	Insect	Insecticide	Dosage	Limitations, remarks (Days before harvest)
Sorghum	Greenbugs	ethyl parathion	½ lb.	12 days, aerial application. Methyl parathion may cause plant injury.
		dimethoate	¼ to ½ lb.	28 days
		disulfoton	½ to 1 lb.	7 days (grain)
		malathion	1 lb.	7 days
Sunflowers	Sunflower moth larvae	phorate	½ to 1 lb.	28 days
		endosulfan (Thiodan)	1 lb.	Not more than 3 applications. Do not feed treated plants. No limitations on use of seeds.
		methidathion (supracide)	½ lb.	2 or 3 treatments at least 50 days before harvest. Highly toxic to bees.
		methyl parathion	1 lb.	No more than 3 applications. 5 day intervals 30 days before harvest.
Mustard, rape seed	Fleabeetles	carbaryl (Sevin)	1 to 1½ lb.	14 days
	Diamond back moth larvae	carbaryl malathion	1 to 1½ lb. 1½ lb.	14 days 7 days
Wild rice (in paddies)	Wild rice worm	malathion	1 to 1½ lb.	14 days after eggs appear in florets. Additional applications as needed. 7 days.
Bluegrass (for seed)	Plant bugs (Capsus)	diazinon	½ lb.	No limitations
		malathion	¾ lb.	No limitations
		Treat as heads emerge when Capsus bugs are detected or at first sign of silver top.		
Bluegrass, Timothy (for seed)	Meadow plant bug	malathion	¾ lb.	No limitations
	Treat at early heading stage when there is an average of two bugs per net sweep.			
	Armyworm	carbaryl malathion	1½ lb. 1 lb.	No limitations No limitations
		Treat when there are 5 worms per sq. ft.		
Corn, sweet	Earworm	carbaryl	1½ lb.	No limitations before harvest. Highly toxic to bees. Do not apply as dust to pollinating corn. Avoid treating while bees are in the field.
		diazinon	1½ lb.	2 days
		endosulfan (Thiodan)	1½ lb.	Not on corn for processing. Not more than 5 applications. No not feed treated forage.
		methomyl (Lannate, Nudrin)	¼ to ½ lb.	3 days, forage. May cause injury to some varieties.
	Corn rootworm larvae	Dasanit Dyfonate Mocap phorate	}	See under field corn

Crop	Insect	Insecticide	Dosage	Limitations, remarks (Days before harvest)	
	Corn rootworm adults	carbaryl	1 lb.	No time limitations, see bee precautions under earworm.	
		diazinon	½ — 1 lb.	2 days	
		malathion	1 lb. or 4 oz. technical as ULV	5 days	
		EPN	¼ lb.	14 days	
	Cutworms, armyworms	carbaryl	1½ to 2 lb.	No limitations. Bait is generally more effective than spray for cutworms.	
		toxaphene trichlorfon	2 lb. 1 lb.	Do not feed or ensile treated plants. 28 days	
	European corn borer	carbaryl	1 to 2 lb.	No time limitations; see bee precautions under earworm.	
	European corn borer	diazinon	1 to 2 lb.	10 days for forage	
		Dyfonate	1 lb.	45 days	
		EPN	¼ lb. granular ¼ lb. spray	14 days	
Wireworms	Gardona	1 lb.	5 days, forage		
	heptachlor*, lindane*, diazinon	1 oz. per bu.	Seed treatment only.		
	diazinon	1 to 2 lb.	} Band on the row at planting.		
	Dyfonate	1 lb.			
phorate	1 lb.				
Peas	Aphids	demeton (Systox)	¼ lb.	21 days	
		diazinon	½ lb.	1 day feeding of vines, 4 days hay.	
		dimethoate (Cygon, De-Fend, Rebelate, Dimex 267)	3 oz.	Do not feed or graze vines if mobile viner is used. 21 days if stationary viner is used.	
		disulfoton	1 lb.	As granules broadcast at planting. 50 days	
		malathion	1 lb.	3 days. 7 days for forage.	
		mevinphos (Phosdrin)	0.2 lb.	1 day	
	Aphids	naled (Dibrom)	1 to 2 lb.	4 days	
		parathion	¼ lb.	10 days	
		Loopers	carbaryl	1½ to 2 lbs.	No time limitations.
			methomyl	½ to 1 lb.	1 day
parathion	½ lb.		15 days		
	mevinphos	4 oz.	1 day		
Beans, dry, edible	Aphids	diazinon	½ lb.	7 days. No more than one application.	
		disulfoton	1 to 2 lb.	Soil treatment banded on the row. Do not place with seed.	
		dimethoate	½ lb.	N.T.L. Do not feed forage.	
		endosulfan	¾ lb.	No more than 3 applications. Do not treat Lima beans. Do not feed forage.	
		malathion phorate	1 lb. 2 lb.	1 day Soil treatment banded on row at planting. Do not place with seed. 60 days, forage.	

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Crop	Insect	Insecticide	Dosage	Limitations, remarks (Days before harvest)
	Bean Leaf Beetle	carbaryl	1 lb.	NTL
		methoxychlor	1 lb.	1 day
	Green Clover-worm	carbaryl	1 lb.	NTL
		malathion	1 lb.	1 day
	Leafhoppers	carbaryl	1 lb.	NTL
		dimethoate	¼ lb.	Do not feed forage.
		disulfoton	See Aphids	
		endosulfan	See Aphids	
		malathion	1 lb.	1 day
	methoxychlor	1 lb.	1 day	
	phorate	See Aphids		
Seed corn			1 to 2 oz. per bu.	
	maggot, wireworm	diazinon	as seed treatment.	

Stored Grain Insects

Grain in Minnesota is generally safe from infestation by stored grain insects before harvest. The only exception may be where grain is cut and swathed adjacent to storage bins being treated with an insecticide in preparation for the new crop. Stored-grain insects will migrate from treated bins, at least temporarily.

Accumulations of post-harvest grain or grain products is a primary target for insect infestations especially if it is stored with or adjacent to last year's crop or in storage facilities also used for livestock or where livestock feed is housed.

Inspect grain at 30-day intervals, especially during the summer and autumn months, to determine if treatment is needed. Check for insects by taking the grain temperature and by looking for the insects themselves. To take the grain temperature, fasten a thermometer to a stick and sink it into the grain 2 feet below the surface. If insects are active, the temperature will be above 65° F. and may range as high as 100° F. To inspect for insects, insert a grain probe in the center of the bin 2 feet below the grain surface. Sift the grain samples through a 10 to 12 mesh to the inch screen to separate-out insects.

Prevention

Spraying Facilities:

Thoroughly clean combines, trucks, wagon beds, elevators, and bins. Spray the surfaces of the equipment that will be in contact with the grain with one of the following insecticides 2 to 6 weeks before harvest:

Pesticide formulation	Amount of Pesticide Formulation Per 2 Gallons of Water
methoxychlor 50% W.P.	12 oz.
or	
methoxychlor 25% E.C.	1 qt.
or	
pyrethrins 6% E.C. com- bined with piperonyl butoxide 60%	1½ pts.
or	
malathion — premium grade (Cythion) 57% E.C.	½ pt.
oz. = ounce	W.P. = wettable powder
qt. = quart	E.C. = emulsifiable concentrate
pt. = pint	

Spray to the point of run-off using 1 gallon of total formulation (one of the insecticides listed above) per 500 sq. ft. of surface. Allow treated surfaces to dry before contacting grain. Also spray, if possible, the outside walls of the bins to a height of 6 feet and the ground to a distance of 6 feet out from the foundation of each bin.

If it is not possible to remove the old grain, then it should be checked carefully for stored-grain insects and, if needed, treated with recommended residual insecticides or fumigants before adding new grain.

Grain stored with less than 12% moisture, below 70° F. and with a low amount of dockage or cracked grain is relatively safe from significant damage by stored-grain insects.

Grain Protectants: Insect infestations are prevented or reduced by treating small grains and shelled corn as it is moved into storage.

malathion 1 pt. premium-grade E.C. per 2 to 5 gal. water per 1,000 bu.
malathion 1% premium-grade of wheat flour dust, 60 lb. per 1,000 bu.
synergized pyrethrins 1 qt. of pyrethrins 6% combined with piperonyl butoxide 60% E.C. in 3 to 5 gal. of water per 1,000 bu. Spray onto the grain stream as it goes into storage.

Surface Grain Treatments:

malathion	½ to 1 pint premium-grade E.C. in 2 gal. water per 1,000 sq. ft. of grain surface area.
malathion	1% premium-grade of wheat flour dust, 30 lb. per 1,000 sq. ft.
synergized pyrethrins	8 oz. of pyrethrins 6% combined with piperonyl butoxide 60% E.C. in 1 to 2 gal. of water per 1,000 sq. ft. of grain surface.

Apply the spray evenly over the surface immediately after the grain is loaded into storage and leveled off. Repeat if necessary.

The Indian-meal moth is generally found in the top 6 to 12 inches of stored shelled corn and is becoming a similar pest in stored soybeans, especially in areas just south of Minnesota. At the same time there is evidence from some areas that this moth is developing resistance to malathion. If malathion is ineffective, apply synergized pyrethrins, fumigants, or a refined mineral oil. The mineral oil must be unsulfonated, technically white, 100-200 seconds viscosity, and free of objectionable odors. Two quarts of the mineral oil should be applied per 100 square feet of corn surface.

A new preventative treatment for Indian-meal moths is to suspend 1 dichlorvos (Vapona) "No-Pest Strip" per 1,000 cubic ft. of space over the binned grain. The dichlorvos is effective against adult moths only. These "Vapona" strips must be in place before moths begin to emerge in early spring. This treatment is usually effective for 3 months.

Control

Fumigation: Fumigants are applied to binned grain to stop established insect infestations. Best fumigation results are obtainable using the following guidelines:

1. Level the grain. Remove or breakup any crust in the grain.
 2. Seal all cracks making the bin as air-tight as possible.
 3. Fumigate on a still day preferably when the **grain** temperature is above 70° F. Wind causes rapid leakage of the gas and results are poor.
 4. Methods of applying fumigants vary with the type of fumigant, commodity and storage facility. Most farm storages will use the gravity penetration method. Apply the correct amount of fumigant as a coarse spray evenly over the surface of the grain. Cover the grain with a tarpaulin if there is a large air-space above the grain.
 5. The operator should stay out of the bin. Apply the fumigant from outside of the bin. Do not breathe vapor or fumes. Use a recommended gas mask with canister, and always work in pairs.
 6. Keep the bin closed for at least 72 hours. Do not enter the bin during or after fumigation until gases have been thoroughly removed by aeration.
 7. When under fumigation, the storage bins should be locked and identified with "DANGER — KEEP OUT" signs to prevent entry and avoid accidents.
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Some of the recommended fumigant dosages are tabulated below:

Fumigant	Dosage (gal. per 1,000 bu.)			
	Small grain		Shelled corn	
	Wooden bins	Metal bins	Wooden bins	Metal bins
Carbon tetrachloride-carbon disulfide, 80-20	4	2	6	3
Carbon tetrachloride-ethylene dibromide, 95-5	4	2	8	4
Carbon tetrachloride-ethylene dichloride, 3-1	6	3	8	4
Carbon tetrachloride-ethylene dichloride-ethylene dibromide, 60-35-5	4	2	8	4

Use other liquid fumigant mixtures as labeled.

Aluminum phosphide (Phostoxin). Tablets may be added to grain as it is binned, or probed into binned grain.

Type of storage	Grain temperature	Dosage (per 1,000 bu.)	
		Tablets	Pellets
Concrete or steel elevator tanks	54-59° F.	150	500
	60-68° F.	90	300
	over 68° F.	60	200
Round steel bins ("Butler" type)	54-59° F.	180	600
	60-68° F.	120	400
	over 68° F.	90	300

For average wooden farm bins use 180 tablets per 1,000 bu.

Read and follow all precautions listed on the labels for each different fumigant. Repeat fumigants may be necessary. Information about other fumigants is available from the Department of Entomology, Fisheries and Wildlife, University of Minnesota.



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