

B-1305

Texas Guide for Controlling Insects on Commercial Vegetable Crops



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Texas Guide For Controlling Insects on Commercial Vegetable Crops

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Because of market demand, low tolerances are maintained for insect damage on edible foods. To meet stringent market requirements, insect control is often a preventative program. Vegetable crops should be inspected two to three times a week for insect pests to determine when to initiate insecticide use and properly time subsequent applications.

Application Methods

Granules — Apply granules (drilled or broadcast) through fertilizer, seed applicators or granular application equipment. Check manufacturer's labels for specific application rates. Careful adjustments are necessary at frequent intervals to insure correct dosage rates. Disk granular material into the soil immediately after broadcast application is made.

Sprays — For maximum coverage by air, use a minimum of 5 gallons of spray material per acre. For ground application, use at least 10 gallons per acre. Ground sprayers should have two or three nozzles per row and operate at a minimum of 60 pounds pressure to provide thorough coverage of lower and upper leaf surfaces. Sprays commonly give better results than dusts.

Systemic Insecticides — Systemic insecticides applied in the soil or to the foliage have been successful in controlling various insect pests of vegetables. These materials are effective if sufficient germinating moisture is present. Check the table of suggestions for specific uses on different vegetable crops.

Predators, Parasites and Diseases

Most vegetable pests, including leafminers, aphids and cabbage loopers, are attacked by various parasites, predators and pathogens or "disease-causing agents". More than 10 parasite species attack leafminer populations and the pests may be reduced effectively by parasites alone. Several species of parasite and predators attack aphids on various crops, but may not reduce aphid populations below economic levels. A naturally occurring polyhedral virus frequently reduces cabbage looper populations. However, economic damage from cabbage looper often occurs before the virus effectively reduces the population, thus necessitating insecticidal control.

Plant Virus Diseases and Insects

Various insects transmit aster yellow disease of carrots; curly top disease of spinach and tomatoes; mosiac disease of cucurbits and lettuce; tobacco etch disease of pepper; and tobacco ringspot disease of beans, cucurbits and eggplants. Aster yellow virus is transmitted by the aster leafhopper; curly top virus by the beet leafhopper; squash mosiac by the spotted, striped and banded cucumber beetles; and tobacco etch by the green peach aphid.

Sweet Potato Weevil Control

Growers can prevent or greatly reduce sweet potato weevil infestations by using the following procedures:

Seed — Plant weevil-free seed pieces or slips. If possible, obtain seed pieces or slips from an uninfested area. If this is not possible, carefully examine each sweet potato chosen for seed; reject any that are infested. Store seed potatoes separately from other sweet potatoes. Store one layer at a time. Cover each layer with Imidan® dust at the rate of 2 to 4 ounces ofdust per 50 pounds of seed potatoes.

Storage Places — Empty and clean all storage places in spring, at least one month before the new crops are planted in the field.

Plant Bed — Plant beds and fields should be located away from the previous season's plantings and other sources of weevil infestations.

Field Plants — Plant in fields where sweet potatoes were not grown the previous season. Plant vine cuttings in preference to slips to lessen chances of infesting fields with sweet potato weevils. Throw the soil up high around the base of the vines at the last cultivation, or use sweet potato varieties that develop beneath the soil surface.

Good cultural and sanitary practices during storage and in the plant bed should provide weevilfree transplants. However, weevil infestations may develop from outside sources. **Harvest** — Store only weevil-free sweet potatoes and destroy all those infested with weevils. Immediately after harvest, collect and destroy all crop residue — stems, roots and cull potatoes.

Plow the field once or twice during winter. Collect and destroy unearthed sweet potato scrap material.

Storage — Sweet potatoes to be stored in quantity may be treated with 5 percent Imidan® dust at the rate of 2 to 4 ounces per 50 pounds of potatoes. Thoroughly cover all surfaces as soon as possible before storage. Wash thoroughly before eating or marketing. Make only one application per season.

Accepted Common Names and Registered Trade Names of Certain Materials Recommended for Vegetable Pest Control

Accepted Common Name Registered Trade Name(s)

- acephate azinphosmethyl Bacillus thuringiensis
- carbaryl carbophenothion cryolite demeton diazinon dicofol dimethoate

disulfoton endosulfan ethion fensulfothion fenvalerate fonofos isofenfos malathion methamidophos methoxychlor methyl demeton methomyl methyl parathion mevinphos monocrotophos naled oxamvl oxydemeton-methyl parathion permethrin phorate phosmet phosphamidon tetradifon trichlorfon

Orthene® Guthion® Biotrol[®], Dipel[®], Thuricide®, Bactospeine® Sevin® Trithion® **Kryocide**® Svstox® Kelthane® Cygon®, De-Fend®, **Rebelate**® Di-Syston® Thiodan® Nialate® Dasanit® **Pvdrin**® Dyfonate® Amaze® Cythion® Monitor® Marlate® Metasystox® Lannate® or Nudrin® **Phosdrin**® Azodrin® Dibrom® Vvdate® Metasystox-R®

Ambush®, Pounce® Thimet® Imidan® Dimecron® Tedion® Dylox®

Precautions

All insecticides are poisonous and lawfully must be handled according to label instruction. Before using an insecticide, refer to the product label for any special instructions pertaining to mixing and applying the product, special protective clothing and proper safety equipment needed. Avoid exposure to insecticides. Do not breathe mists or enter drift. Change clothes and bathe immediately after completing work.

Vegetables with excessive insecticide residues can be confiscated under the provisions of the federal or Texas food and drug laws. Follow suggestions in this guide and on the insecticide label giving the number of days required between last application and harvest. Suggested insecticides can be used safely when directions and precautions are followed carefully.

For additional information, contact your county Extension agent, area Extension entomologist or write the Extension entomologist, Texas Agricultural Extension Service, Texas A&M University, College Station, Texas 77843.

Protecting Bees and Other Pollinators from Insecticides

Pollination is extremely important in the production of quality vegetables or vegetable seed crops. This is particularly true of such vegetables as squash, cucumber, pumpkin, watermelon, cantaloupe, muskmelon, asparagus, broccoli, onion and radish. Where pollen-collecting insects are required for flower fertilization, the producer, insecticide applicator and beekeeper should cooperate closely to minimize bee losses.

Commonly Used Pesticides Grouped According to Their Relative Hazards to Honeybees

Highly	Moderately	Relatively
Toxic	Toxic	Non-Toxic
acephate azinphosmethyl carbaryl diazinon dimethoate fensulfothion fenvalerate fonofos isofenfos malathion methamidophos methomyl mevinphos monocrotophos naled parathion permethrin phosmet phosphamidon	carbophenothion disulfoton endosulfan ethion methoxychlor methyl demeton	Bacillus thuringiensis cryolite demeton dicofol oxydemeton- methyl tetradifon trichlorfon

INSECTICIDE USE SUGGESTIONS

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beetle See remarks Endosulfan See remarks Endos	Mexican bean	Endosulfan	1.0	3	
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Our bound of the formed of	Spider mites	Carbonhenothion	05-075	7	
Disulfoton See remarks See rem	opider mites	Demeton	0.3 - 0.75	21	Dicofol - Do not feed untreated grop residue to dairy or
Disulfoton See remarks See remarks <i>Phorate</i> See remarks under aphids. Phorate See remarks		Dicofol	0.58	7	meat animals.
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Phorate See remarks See remarks		Disulfoton	See remarks	See remarks	Phorate — See remarks under aphids.
		Phorate	See remarks	See remarks	

BEANS

Pest	Pesticide (for other designations refer to page)	Pounds actual toxicant per acre	Days from last application to harvest	Remarks
Stink bugs	Azinphosmethyl	0.275 - 0.5	See remarks	
0	Carbaryl	1.2 - 1.5	0	Azianharmethul Coon hoone 7 days, day hoone 20
	Endosulfan	0.5 - 1.0	3	davs
	Methyl Parathion	1.0 - 1.5	15	Naled — See remarks under cabbage looper.
	Naled	1.5	See remarks	
Thrips	Disulfoton	See remarks	See remarks	
	Parathion	0.25 - 0.75	15	Disulfoton — See remarks under aphids.
	Phorate	See remarks	See remarks	Phorate — See remarks under aphids.
			BEETS	
Aphids	Malathion	0.625 - 1.25	7	
	Methyl parathion	0.625	21	Methyl parathion — 15 days if tops are not used as food or
	Maulanhaa	0.105 0.05	See remarks	feed.
	Mevinphos	0.125 - 0.25	3	
Beet webworm	Parathion	0.3 - 0.5	21	Derethion 15 days if have any part was done for a final
	Trichlorfon	2.0	See remarks	Paratinion — 15 days it tops are not used as food of feed.
A # ### 1 # 1 # # # # # #	Cashaaul	1.0	20	
Reet leafbonner	Carbaryi	1.U See remarks	3 Soo romarke	Carbary - 3 days if tops are not used as food or food. For
Flea beetles	Methoxychlor	10-20	14	armyworms use 1 to 2 pounds
	Methyl parathion	0.625	21	Methyl parathion — See remarks under aphids
	inentyr paratnetr	0.020	See remarks	mony parament occremence ander apinae.
Stink Bugs	Carbaryl	1.0 - 1.5	See remarks	Carbaryl — See remarks under armyworms.
	CABBA	GE, BROCC	OLI, AND C	CAULIFLOWER
Aphids	Demeton	0.5	21	Diazinon — May be used on broccoli and cauliflower 5
	Diazinon	0.5	See remarks	days before harvest and on cabbage 7 days before harvest.
	Dimethoate	0.25	7	Dimethoate — May be applied within 3 days before harvest
	Disulfator (arapulas)	1.0	See remarks	on cabbage.
	Disuitoton (granules)	1.0	14 See remarks	Disulfoton — May be applied within 7 days of harvest on
	Endosulfan	0.75	See remarks	broccoli and cabbage.
	Oxydemeton-methyl	0.35 - 0.5	7	Endosulian — Allow 14 days between last application and
			See remarks	tion and harvest on broccoli and cabbage
	Mevinphos	0.25 - 1.0	1	Oxydemeton-methyl - Do not apply more than 3 times per
			See remarks	season. (May be used on broccoli or cabbage within 1 day
	Parathion	0.5	21	of harvest.)
	Phosphamidon	0.5	Soo romarka	Mevinphos - Allow 1 day between last application and
			See remarks	harvest when applied to cabbage and broccoli at .25 pound
				of actual insecticide per acre, 3 days at 1.0 pound actual insecticide per acre
A	Fadaaulfaa	0.75 1.0	7	Phosphamidon — Do not apply to cabbage
Armyworms	Endosultan	0.75 - 1.0	Soo romarke	Endosulfan — Do not use cauliflower within 14 days of
	Methyl parathion	1.0	See remarks	harvest.
	Methomyl	0.5 - 1.0	See remarks	Methomyl - Registered for use on cabbage only.
	Parathion	0.5 - 1.0	10	Parathion — Not labeled for use on cauliflower.
Cabbage looper	Azinphosmethyl	0.25 - 0.5	15	the second s
			See remarks	
Diamondback moth	Bacillus thuringiensis	See label	0	Azinphosmethyl — 21 days for cabbage
				Endosulfan — May be used within 7 days of harvest on
Imported	Endosulfan	1.0	14 Coo romorius	broccoli or cabbage.
cabbage worm	Fenvalerate	01-02	See remarks	Fenvalerate - Do not exceed 1.6 pounds per acre per
	renvalerate	0.1 - 0.2	See remarks	season. Do not feed treated plant parts to livestock.
	Methomyl	0.5	1	Methyl parathion - May be applied to broccoli and
	Methyl parathion	1.0 - 1.5	10	cauliflower up to 21 days from harvest. Not labeled for use
	and the second second		See remarks	on diamonoback moth or imported cabbageworm.
	Mevinphos	0.5	3	use on diamondback moth
			See remarks	Nalad - Lise 20 to 250 callons of water
	CONSULT INTERNET OF ANY ONLY			
	Naled	1.0	1	Permethrin — No more than 8 applications (10 on
	Naled	1.0	1 See remarks	Permethrin — No more than 8 applications (10 on cabbage) per season. Do not feed treated plant parts to

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Pest	Pesticide (for other designations refer to page)	Pounds actual toxicant per acre	Days from last application to harvest	People Spaces active	Remarks	i e più
Cabbage root aphid	Disulfoton (granules)	See remarks	See remarks	Disulfoton drilling or s application at 21-day ir within 42 d within 14 d	— Use 1.7 oz. per 1,000 ft. per row. Appl idedressing and follow with irrigation. Only per season on broccoli and cabbage, and itervals on cauliflower. Do not apply to cabb ays, to cauliflower within 40 days or to broc ays of harvest.	y by one I two bage ccoli
Cutworms	Carbaryl (bait) Diazinon Endosulfan Mevinphos Methomyl Trichlorfon (bait)	2 2.0 1 0.25 - 0.5 0.5 - 1.0 0.5 - 1 in 10 lb. bran bait mix	3 See remarks See remarks See remarks See remarks See remarks	Diazinon – Incorporate Endosulfar Methomyl Mevinphos Trichlorfon broccoli.	 Broadcast application just prior to plan e insecticide in upper 2 to 3 inches of soil m See remarks under aphids. m Not registered for use on broccoli. m See remarks under aphids. bait — Apply to soil surface. Do not app 	ting. I.
Flea beetles	Carbaryl Endosulfan Methoxychlor Methoxychlor plus diazinon 30% EC	0.5 - 1.0 1.0 1 - 2.25 2 1/2 qts.	3 See remarks See remarks 14 See remarks	Endosulfan Methoxych broccoli, 7 Methoxych days before	— See remarks under aphids. <i>lor</i> — May be used within 14 days of harves days on cauliflower, 3 days on cabbage. <i>lor</i> + <i>diazinon</i> — Cabbage and cauliflowe e harvest.	st on er - 7
Stink bug	Endosulfan Parathion	1.0 0.5	7 See remarks 21	Endosulfar	9 — See remarks under aphids.	
Spider mites	Mevinphos Methyl parathion	0.25 - 0.5 1.0	3 See remarks 21	Mevinphos	— See remarks under aphids.	

CANTALOUPES, WATERMELONS, CUCUMBER AND SQUASH

NOTE: These crops are pollinated by bees. Refer to page for information concerning bees. Thorough coverage is important.

				Parathion — See remarks under squash bugs. Phosphamidon — Do not apply to squash; do not use on cantaloupes or watermelons within 1 day of harvest or on cucumbers within 3 days of harvest.
				Parathion — See remarks under squash bugs.
Cucumber beetles	Carbaryl Endosulfan	1.0 0.5 - 1.0	0	Parathion — See remarks under applied. Phosphamidon — Do not apply to squash; do not use on cantaloupes or watermelons within 1 day of harvest or on cucumbers within 3 days of harvest.
Cucumber beetles	Carbaryl Endosulfan Malathion Methamidophos Methoxychlor plus	1.0 0.5 - 1.0 1.25 0.5 - 1.0 2.5 qts.	0 0 1 14 See remarks 3	Parathion — See remarks under squash bugs. Phosphamidon — Do not apply to squash; do not use on cantaloupes or watermelons within 1 day of harvest or on cucumbers within 3 days of harvest. Methamidophos — See remarks under aphids. Methoxychlor + diazinon — May not be used within 7 days of harvest.
Cucumber beetles	Carbaryl Endosulfan Malathion Methamidophos Methoxychlor plus Diazinon	1.0 0.5 - 1.0 1.25 0.5 - 1.0 2.5 qts.	0 0 1 14 See remarks 3 See remarks	Parathion — See remarks under squash bugs. Phosphamidon — Do not apply to squash; do not use on cantaloupes or watermelons within 1 day of harvest or on cucumbers within 3 days of harvest. Methamidophos — See remarks under aphids. Methamidophor + diazinon — May not be used within 7 days of harvest.
Cucumber beetles	Carbaryl Endosulfan Malathion Methamidophos Methoxychlor plus Diazinon Carbaryl (bait) Diazinon Methomyl	1.0 0.5 - 1.0 1.25 0.5 - 1.0 2.5 qts. 1.0 4.0 0.5 - 1.0	0 0 1 14 See remarks 3 See remarks See remarks	Parathion — See remarks under squash bugs. Phosphamidon — Do not apply to squash; do not use on cantaloupes or watermelons within 1 day of harvest or on cucumbers within 3 days of harvest. Methamidophos — See remarks under aphids. Methoxychlor + diazinon — May not be used within 7 days of harvest. Diazinon — Preplant broadcast soil application. Methomyl — Up to 2 pts., 1 day. Over 2 pts., 3 days. Use only on cucumbers and summer squash

Pest	Pesticide (for other designations refer to page)	Pounds actual toxicant per acre	Days from last application to harvest	Remarks
Leafhoppers	Diazinon	0.5	7	
	Malathion	1.0	See remarks 3	Diazinon — Not registered for leafhopper control or cucumbers.
	Methamidophos	0.5 - 1.0	See remarks 14	Malathion — Not registered for control of leafhoppers or cucumbers or squash.
	Parathian	0.25	See remarks	Methamidophos — See remarks under aphids.
	Faratinon	0.35	See remarks	raramon – Geeremarks under squash bugs.
Leafminers	Carbophenothion	0.5 - 1.0	5 See remarks	
	Diazinon	1.0	7 See remarks	
	Dimethoate	0.25	7 See remarks	Carbophenothion — Not cleared for use on winter squash
	Ethion	0.5	0	Dimethoate — Approved for use on melons only.
	Methamidophos	0.5 - 1.0	See remarks 14	Methamidophos — See remarks under aphids.
	Methoxychlor plus	2.5 gts.	See remarks 3	Parathion — May be used on melons up to 7 days before harvest. Do not apply on cucumbers before vining.
	Diazinon Parathion	0.25	15	Phosphamidon — Not cleared for use on squash.
	Phoenhamidan	0.25 0.5	See remarks	
	rnosphannoon	0.23 - 0.5	See remarks	
Melonworm	Bacillus thruingiensis	See label	0	
	Endosulfan	1.0	0	Fervalerate - Do not apply to zucchini squash as injury
	Fenvalerate	0.1 - 0.2	3 Soo romarka	may occur. Do not use more than a total of 1.0 lb. Al.
	Methamidophos	0.5 - 1.0	14 See remarks	Methomyl — See remarks under cutworms.
	Methomyl	05-10	See remarks	Methovychlor + diazinon - Not cleared for use on squash
	Methoxychlor plus	2.5 gts.	3	or cucumbers.
	Diazinon		See remarks	Parathion — See remarks under leafminers.
	Parathion	0.5	15 See remarks	
Pickleworm	Fenvalerate	0.1 - 0.2	3	
	Molothion	1.05	See remarks	Focusionato Coo remerico undor melanum
	Methamidophos	0.5 - 1.0	14	Methamidophos – See remarks under aphids
	Methamaophos	0.0 1.0	See remarks	MethomyI — See remarks under cutworms.
	Methomyl	0.5 - 1.0	See remarks	
	Parathion	0.25 - 0.5	7	
Spider mites	Carbophenothion	0.5	See remarks	
	Dicofol	0.4	2	Carbonhanothion — See remarks under aphids
	Ethion	0.5	0	Ethion — See remarks under leafminers.
	Methamidophos	05-10	14	Methamidophos — See remarks under aphids.
		0.0 1.0	See Remarks	Mevinphos - Not cleared for use on winter squash.
	Methoxychlor plus Diazinon	2 1/2 qts.	3	Oxydemeton-methyl — Not cleared for use on squash. Do not apply to cucumber more than two times per year. May
	Mevinphos	0.375	1 See remarks	be used within 7 days of harvest on watermelons. Apply in minimum of 1 gallon of water.
	Oxydemeton-methyl	0.375 - 0.5	14 See remarks	Parathion — May be used on melons up to 7 days of harvest. Thorough coverage is important.
	Parathion	0.25	15	Tetradifon — Not approved on summer squash; do not apply to cucumbers more than three times during fruiting
	Tetradifon	0.5	See remarks 0	season.
O	0		See remarks	
Squash bug	Carbaryl	1.0	0	Franklande Orienter and Antonio and
	Enuosulian Fenvalerate	0.5	0	Lindana - No time limitations on cantalounes. Do not
	. on and a contract	0.1 0.2	See remarks	apply after bloom opens. Registered on watermelons for
	Lindane	0.35	1	seed treatments only.
	0	0.55	See remarks	Parathion — May be used on melons up to 7 days before
	Parathion	0.25	15	harvest. Do not apply on cucumbers before vining.

Pest	Pesticide (for other designations refer to page)	Pounds actual toxicant per acre	Days from last application to harvest	Remarks
Squash vine borers	Endosulfan Malathion	0.5 - 1.0 1.875	0 1 See remarks	Malathion — Apply only when plants are dry.
	Methoxychlor	1.5	7	
		C	ARROTS	
Aphids	Diazinon Endosulfan (Green	0.5 0.5 - 1.0	10 7	non-selan patienteronomia Barristan Productionale Barristationer Statisticale
	Methyl parathion	1.0	15 See remarks	Methyl parathion — 21 days if tops are to be used as food or feed. Parathion — Do not use treated tops for food or feed.
	Mevinphos Parathion	0.125 - 0.25 0.5	2 15 See remarks	
Beet armyworm	Trichlorfon	1.5	28	
Cutworms	Carbaryl (bait) Mevinphos (climbing cutworm)	2.0 0.25 - 0.5	0 2	
	Cash and (hait)	1.5	20	
Flea beetles	Carbaryl (balt) Carbaryl	0.5 - 1.0	0	
	Methoxychlor Methyl parathion	1.0 - 2.25 1.0	14 15 See remarks	Methyl parathion — 21 days if tops are to be used as food or feed.
Leafhopper	Carbaryl Malathion Methoxychlor Methyl parathion Mevinphos	0.5 - 1.0 0.94 - 1.25 1.0 - 2.25 1.0 0.25 - 0.5	0 7 14 15 See remarks 2 15	Methyl parathion – See remarks under flea beetles. Parathion – See remarks under aphids.
	Faratmon	0.575	See remarks	
Vegetable weevil	Parathion	0.5	15 See remarks	Parathion — See remarks under aphids.
Wireworms	Diazinon (Granules) Parathion	2.9 - 3.9 3.0 - 4.0	See remarks See remarks	<i>Diazinon</i> — Preplant application only. <i>Parathion</i> — Preplant application only.
		(CELERY	
Aphids	Acephate (Green peach aphid) Diazinon	0.5 - 1.0 0.5	21 See remarks 10	Acephate — Plants should be trimmed before shipping. Do
	Endosulfan Methyl parathion Mevinphos	0.5 1.0 0.25 - 0.5	4 15 3	Diazinon — Do not use tops for food or feed.
Armyworms	Acephate Bacillus thuringiensis	1.0 See label	21 See remarks See label	Aconhate See remarks under aphide
	Methomyl Methyl parathion Permethrin (Fall armyworm)	0.23 - 0.45 1.0 0.1 - 0.2	7 15 3 See remarks	Permethrin — Do not graze or feed to livestock.
Beet armyworms	Acephate Methomyl Permethrin	1.0 0.45 - 0.9 0.1 - 0.2	21 See remarks 7 3 See remarks	Acephate — See remarks under aphids. Permethrin — See remarks under armyworms.
Cabbage loopers	Acephate	0.5 - 1.0	21 See remarks	
	Bacillus thuringiensis Methomyl Parathion Permethrin	See label 0.45 - 0.9 0.5 0.1 - 0.2	0 7 30 3	Acephate — See remarks under aphids. Permethrin — See remarks under armyworms.

Pest	Pesticide (for other designations refer to page)	Pounds actual toxicant per acre	Days from last application to harvest	Remarks
Cutworms	Diazinon (granules) Parathion (climbing	2.0 - 4.0 0.5	See remarks 30	Diazinon — Preplant application only.
	Permethrin	0.1 - 0.2	3 See remarks	Permethrin — See remarks under armyworms.
Flea beetles	Diazinon	0.5	10 See remarks	Diazinon — Do not use tops for food or feed.
	Methyl parathion	1.0	15	
Leafhoppers	Mevinphos Parathion	0.25 - 0.5 0.75	5 30	All the second sec
Leafminers (Dipterous)	Azinphosmethyl Mevinphos Oxamyl Permethrin	0.5 0.25 - 0.5 0.5 - 1.0 0.1 - 0.2	14 5 14 3 See remarks	<i>Permethrin —</i> See remarks under armyworms.
Mites	Demeton Malathion Methyl parathion Mevinghos	0.25 (in 100 gal. water) 0.94 1.0 0.25 - 0.5	28 7 15 3	
Wireworms	Diazinon (granules) Parathion (bait)	2.9 - 4.0	See remarks See remarks	Diazinon — Preplant application only. Parathion — Preplant application only.
		EG	GPLANT	
Aphids	Demeton	0.25 - 0.375	7	
	Endosulfan	0.5	1	
	Naled	1.0	1	
	Oxydemeton-methyl	0.25 - 0.375	7	
Armyworms	Carbaryl Methoxychlor	1.0 - 2.0 1.0 - 2.25	0 7	
Flea beetles	Azinphosmethyl	0.5	See remarks	
	Carbaryl	0.5 - 1.0	0	Azinnhosmethyl - Do not apply after fruit sets
	Methoxychlor	1.0 - 2.25	7	Azimphosmetriyi — Do not apply after trut sets.
	Naled	1.0	1	
Fruitworm	Carbaryl	1.0 - 2.0	0	
Lace bugs	Carbaryl	1.0 - 2.0	0	
	Malathion	1.875	3 15	
Leafhonners	Carbaryl	0.5 - 1.0	0	
Leamoppers	Carbophenothion	0.5 - 1.0	7	
	Mevinphos	0.25 - 0.5	2	
Leafminers	Azinphosmethyl Carbophenothion Naled	0.375 - 0.5 0.5 - 1.0 1.0	See remarks 7 1	Azinphosmethyl — Do not apply after fruit sets.
Mites	Carbophenothion	0.5 - 1.0	7	
	Ethion	0.25 - 0.5	0	
	Mevinphos	0.25 - 0.5	2	
Stink bugs	Carbaryl	1.0 - 2.0	0	
	Endosulfan	0.5	1	
	Parathion	0.5	15	
whiterly	Naled Parathion	0.5 1.0 0.5	1 15	
		L	ETTUCE	
	(SPRAYS OI	VIY)		
Aphids	Acephate (Green peach aphid Demeton Diazinon Mevinphos Parathion	0.5 - 1.25 0.25 - 0.5 0.25 - 0.35 0.25 0.5	21 See remarks 21 10 2 7 See remarks	Thorough coverage is important. Acephate — Do not apply more than 5.0 lbs. Al/acre/sea- son. Parathion — Do not apply on leaf lettuce within 21 days of harvest.

Pest	Pesticide (for other designations refer to page)	Pounds actual toxicant per acre	Days from last application to harvest	Remarks
Cabbage looper Imported cabbageworm	Acephate Bacillus thuringiensis Methomyl	1.25 0.5 - 1 0.45	21 See remarks 0 7 See remarks	Begin control when worms are small. Acephate — See remarks under aphids. Methomyl — Not registered for use on imported cabbage- worm. Permethrin — Do not use on leaf lettuce. Use no more than
	Permethrin	0.05 - 0.1	1 See remarks	10 applications per season. Not cleared for use on imported cabbageworm.
Corn earworm	Carbaryl Permethrin	1.6 0.1 - 0.2	3 1 See remarks	Permethrin — See remarks under cabbage looper.
Cutworms	Trichlorfon	0.5 - 1 in 10 Ib. bran bait mix	28 See remarks	Trichlorfon — Apply to soil surface.
Leafhoppers	Malathion Parathion	1.25 0.35	See remarks 7 See remarks	Malathion — Leaf 14, head 7. Parathion — See remarks under aphids.
		MUSTARD	AND TUR	NIPS
Aphids	Diazinon	0.25 - 0.5	10 See remarks	
	Dimethoate Malathion Mevinphos	0.25 0.625 - 1.25 0.125 - 0.25	14 7 3	<i>Diazinon</i> — Not labeled for use on mustard.
Armyworms	Carbaryl Methyl parathion	1.0 - 2.0 0.5 - 1.5	See remarks 21 See remarks	Carbaryl — 14 days on mustard and turnip tops. Three days on turnips if only tops are eaten. Methyl parathion — On mustard (spring and summer) 10; (fall and winter) 15. On turnips, 21 if tops are eaten, 12 if only root is eaten.
Cabbage looper	<i>Bacillus thuringiensis</i> Mevinphos Parathion	See label 0.25 - 0.5 0.5	0 3 See remarks	Parathion — See remarks under armyworms.
Corn earworm	Carbaryl	1.0 - 2.0	14 See remarks	Carbaryl — 3 days on turnips if only root is eaten.
Diamondback moth (larvae)	Bacillus thuringiensis	See label	0	
Flea beetles	Carbaryl Malathion Methoxychlor	0.5 - 1.0 0.94 - 1.25 1.0 - 2.25	See remarks 7 See remarks 14 See remarks	Carbaryl — See remarks under armyworms. Malathion — Not labeled for use on turnips. Methoxychlor — Not cleared for use on mustards.
Harlequin bugs	Carbaryl Parathion	0.5 - 1.0 0.5	14 See remarks	Parathion — See remarks under armyworms.
Imported cabbageworms	Bacillus thuringiensis Carbaryl Malathion Mevinphos	See label 1.0 - 2.0 0.625 - 1.25 0.25 - 0.5	0 See remarks 7 3	Carbaryl — See remarks under armyworms.
Leafhoppers	Carbaryl Dimethoate Methyl parathion	0.5 - 1.0 See remarks 0.25 0.5 - 0.75 See remarks	See remarks 14	Carbaryl — Use on mustard at a rate of 1.0 to 1.5 lbs. For preharvest interval, see remarks under armyworms. Methyl parathion — On mustard use a rate of 0.5 - 1.5 lbs. For preharvest interval, see remarks under armyworms.
Leafminers	Dimethoate Methyl parathion Mevinphos Parathion	0.25 0.5 - 0.75 0.25 - 0.5 0.5	14 See remarks 3 See remarks	Methyl parathion — Not labeled for use on mustard. For preharvest interval, see remarks under armyworms. Parathion — See remarks under cabbage looper.
Mites	Methyl parathion	0.5 - 0.75 See remarks	See remarks	Methyl parathion — See remarks under leafhoppers.
Stink bugs	Carbaryl	1.0 - 2.0	See remarks	Carbaryl – See remarks under armyworms.
			OKRA	10.4 mentes es bridad
Aphids	Malathion Mevinphos Parathion	0.625 - 0.938 0.125 - 0.25 0.5	1 1 21	Brandmin Q1-0.

Pest	Pesticide (for other designations refer to page)	Pounds actual toxicant per acre	Days from last application to harvest	Remarks
Corn earworm	Carbaryl Mevinphos	1.0 - 2.0 0.25 - 0.5	0 1	Advertures and Advertures Advertures
Leafminers	Parathion	0.25 - 0.5	21	
Spider mites	Mevinphos Parathion	0.25 - 0.5 0.25 - 0.5	1 21	and a stand ball
Stink bugs	Carbaryl Mevinphos Parathion	1.0 - 2.0 0.25 - 0.5 0.5	0 1 21	and a second sec
The second real for		(ONIONS	
Beet armyworm	Methomyl See remarks	0.45	28 - Green 7 - Dry	Methomyl — Use a wetting agent.
Climbing cutworm	Mevinphos	0.25 - 0.5	1	an Designer the State of State
Onion maggot	Diazinon (granules) Fensulfothion Fonofos Parathion	2-4 1.0 1.0 2.0	See remarks See remarks See remarks 15 See remarks	 Diazinon — Use preplant, broadcast application. Fensulfothion — Use at time of planting. Fonofos — Use on organic soils only. Use in furrow at time of planting. Parathion — Use at time of planting.
Thrips	Azinphosmethyl Malathion Methomyl See remarks Methyl parathion Mevinphos Oxyamyl	0.5 - 0.75 0.94 0.45 0.25 0.25 - 0.5 0.25 - 0.5	28 - Green 7 - Dry See remarks 3 28 - Green 7 - Dry 15 1 7	<i>Azinphosmethyl</i> — Do not apply more than three times per season. <i>Methomyl</i> — Use a wetting agent.
	Parathion	0.25	15	
Wireworms	Diazinon (granules) Parathion 10G (granules)	2.9 - 3.9 3.0 - 4.0	See remarks See remarks	<i>Diazinon</i> — Preplant application only. <i>Parathion</i> — Preplant application only.
Application and a second s		F	PEPPER	
Aphids	Diazinon Dimethoate Malathion Methyl parathion Mevinphos Oxydemeton-methyl	0.25 0.25 - 0.33 0.625 - 1.56 1.0 0.125 - 0.25 0.5	5 0 3 See remarks 15 2 0 See remarks	<i>Malathion</i> — Use in 100 gallons of water. <i>Oxydemeton-methyl</i> — Do not use more than twice per season.
Aphids (Green Peach)	Acephate Endosulfan Methamidophos Methomyl	0.5 0.5 0.5 0.5 0.45	7 1 7 10	<i>Methamidophos</i> — Up to 5 applications may be made, during the months of November - February.
Armyworms	Bacillus thuringiensis Carbaryl Methomyl Methyl parathion	See label 1.0 - 2.0 0.45 0.5	0 0 10 15	
Cutworms	Carbaryl Diazinon (granules) Methyl parathion (climbing and surface feeding)	2.0 1.96 - 3.9 0.5	0 See remarks 15	<i>Diazinon</i> — Preplant application only.
Flea beetles	Carbaryl Endosulfan Methamidophos	0.5 - 1.0 0.5 0.5	0 1 7 See remarks	Methamidophos — See remarks under aphids.
	Methoxychlor Methyl parathion Naled Permethrin	1.0 - 2.25 1.0 1.0 0.1 - 0.2	See remarks 7 See remarks 15 1 3 See Remarks	Methoxychlor - May be harvested within 1 day if 1.75 lb. or less is used. Permethrin — Do not exceed 8 applications per season.
Fruitworm	Bacillus thuringiensis Carbaryl	See label 1.0 - 2.0	1 0	

Pest	Pesticide (for other designations refer to page)	Pounds actual toxicant per acre	Days from last application to harvest	Remarks
Leafminers	Azinphosmethyl Dimethoate	0.375 - 0.5	3 0	
	Ethion Methamidophos Parathion Permethrin	0.5 0.5 0.5 0.1 - 0.2	See remarks 0 7 See remarks 15 3	Azinphosmethyl — 14 days if more than four applications are used. Methamidophos — See remarks under aphids. Permethrin — See remarks under flea beetles.
Mites	Carbophenothion Dicofol Ethion Methyl parathion Mevinphos	0.5 - 1.0 0.53 - 0.78 0.25 - 0.5 1.0 0.25 - 0.5	See remarks 7 2 0 15 2	
Pepper weevil	Cryolite Permethrin	24 - 48 0.1 - 0.2	See remarks 3 See Remarks	Cryolite — Wash off residue. Permethrin — See remarks under flea beetles.
Stink bugs	Carbaryl	1.0 - 2.0	0	
Thrips	Methamidophos Parathion Permethrin	0.5 0.5 0.1 - 0.2	7 See remarks 15 3 See Remarks	<i>Methamidophos</i> — See remarks under aphids. <i>Permethrin</i> — See remarks under flea beetles.
Wireworms	Diazinon (granules) Fonofos Parathion (granules)	2.9 4.0 3.0 - 4.0	See remarks See remarks See remarks	Diazinon — Use as a preplant broadcast application. Fonofos — Use as preplant broadcast application. Parathion — Use a preplant broadcast and disc in approximately 3 weeks prior to planting.
		POTA	TOES (IRIS	H)
Aphids	Diazinon Dimethoate Mevinphos Parathion	0.25 - 0.375 0.25 - 0.5 0.125 - 0.25 0.25 - 0.5	35 7 1 5	
Colorado potato beetle Flea beetles, Leafhoppers	Azinphomethyl Carbaryl Endosulfan Parathion	0.31 See remarks 0.5 - 1.0 0.5 - 1.0 0.25 - 0.5 See remar⊾s	7 0 0 5	Azinphosmethyl — Use at a rate of 0.5 - 1.25 lb. on flea beetles. Parathion — Use at a rate of 1.5 lb. on leafhoppers.
Mites	Methyl parathion Mevinphos Parathion	1.5 0.25 - 0.5 0.25 - 0.5	5 5 5	uro barmani Caraba Caraba Caraba
Potato Psyllid	Endosulfan Fenvalerate Parathion	0.75 - 1.0 0.05 - 0.1 0.25 - 0.5	0 7 See remarks 5	<i>Fenvalerate</i> — Do not graze or feed vines to livestock. Do not use more than 1.4 lb. Al/acre/season.
Wireworms	Diazinon (granules) Fensulfothion (granules) Fonofos (granules) Parathion (granules)	2.9 - 5.8 2.0 4.0 4.0 - 6.0	See remarks See remarks See remarks See remarks	Diazinon — Use as a preplant broadcast application. Fensulfothion — Same as above. Fonofos — Same as above. Parathion — Same as above.
		R	ADISHES	
Aphids	Diazinon Malathion	0.25 - 0.5 0.94 - 1.25 (in 100 gal. of water)	10 7	
Armyworm	Carbaryl	1.0 - 2.0	3	
Flea beetles Leafhoppers	Carbaryl Methoxychlor	0.5 - 1.0 1.0 - 2.25	3 14	
Stink bugs	Carbaryl	1.2 - 2.4	3	

Pest	Pesticide (for other designations refer to page)	Pounds actual toxicant per acre	Days from last application to harvest	Remarks
	S. Martinery	S	PINACH	eater yours
Aphids	Dimethoate	0.25	14	
	Endosulfan (green peach aphids	0.75	21	
	Methyl parathion Mevinphos	0.625 0.125 - 0.25	21 4	
Armyworm	Cabaryl	1.0 - 2.0	14	
	fall armyworm) Methyl parathion	0.5 - 1.0	21	
Cabbage looper	Bacillus thuringiensis	See label	0	Berlin and - University in the second
	Methomyl	0.5 - 1.0	7	Permethrin — Do not make more than 7 applications per
	Nevinphos Permethrin	0.25 - 0.5	4	season.
	reimetiini	See remarks		
Cutworms	Diazinon (granular)	1.96 - 3.92	See remarks	
	Methomyl	0.5	7	
	(varigated cutworm) Mevinphos	0 25 - 0 5	4	Diazinon — Use as a preplant broadcast application.
	Permethrin	0.1	7	renneunn — See rennands under cabbage looper.
		See remarks		
Leafhoppers	Carbaryl (aster leafhopper)	1.0 - 1.5	14	
	Dimethoate	0.25	14	Parmethrin - See remarks under cabhaga loopar
M	Methyl parathion Mevinphos	0.625	21	Parmatinini — See remarks under cabbage looper.
	Permethrin	0.1		
		See remarks		19
Mites	Azinphosmethyl	0.31 - 0.5	14	
Disuitoton Methyl parathion Mevinphos	Methyl parathion Mevinphos	0.625 0.25 - 0.5	21 4	<i>Disulfoton</i> — Use at time of planting.
Thrips	Disulfoton	1.0	See remarks	Disulfoton — Use at time of planting.
	To State The section	SWI	EET CORN	
Aphids	Disulfoton (granules)	1.0	40	
	Mevinphos	0.125 - 0.5	1	
	Oxydemeton-methyl	0.375	7	
Corn earworm	Carbarvl	1.0 - 2.0	0	
	Diazinon	1.0 - 1.25	0	
	Endosulfan	1.5	See remarks	Endosulian — For fresh use only.
	renvalerate	See remarks	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Methomyl — 3 days if used for forage. 0 days for ears
	Malathion	0.625	5	Permethrin — Apply no more than 6 applications per
	Methomyl	0.3 - 0.45	See remarks	season.
	Fermeunni	See remarks		
Armyworms	Carbaryl	1.0 - 2.0	0	
	Methomyl	0.23 - 0.45	See remarks	Methomy/ - See remarks under corp earworm
	Methoxychlor	1.0 - 2.25	7	wenomy - See temarks ander com earworm.
	Themorion	0.5 - 1.0	T DOTATO	
		SWEE	PUTATUE	
Corn rootworms White grubs	Disulfoton Fensulfothion	See remarks See remarks	28 See remarks	Disulfoton — For larvae use 1.2 oz. of 8 EC per 1,000 ft. of row. For adults use 8 to 16 oz. of 8 EC per 100 ft. of row.
Wireworms	Fonofos (granules) Isofenfos	0.75 - 1.0 See remarks	See remarks See remarks	of row. At cultivation (40 days or more from harvest) use 6- 8 oz. of 15G per 1,000 ft. of row. Not cleared for use on white grubs or wireworms.
				Fonofos — Use at time of planting.
				<i>Isofenfos</i> — Use 1.6 oz. of 6EC per 1,000 ft. of row. Make 1 application per season at planting or cultivation.
Fall armyworms	Methoxychlor	1 - 2	7	
Flea beetles	Endosulfan	0.5	0	
	Fonotos Methoxychlor	4.0 1 - 2	See remarks 7	Fonofos — See remarks under wireworms.

Pest	Pesticide (for other designations refer to page)	Pounds actual toxicant per acre	Days from last application to harvest	Remarks
Sweet potato weevil	See text, pages 3 and	4		
White grubs	Fonofos	4.0	See remarks	Fonofos — See remarks under wireworms.
Wireworms	Chlorpyrifos Diazinon (granular) Fonofos	0.5 - 2.0 3.0 4.0	See remarks See remarks See remarks	Chlorpyrifos — Use at time of planting. Diazinon — Broadcast at time of planting and in top 4 to 8 inches of soil immediately. Fonofos — Broadcast at planting or over the top at root swelling.
		то	MATOES	
Aphids	Demeton	0.25 - 0.375 (in 100 gal. of water)	3	
	Diazinon	0.5	1	
	Dimethoate Disulfoton (granules) Endosulfan (Green peach anhid)	0.25 - 0.5 See remarks 2.25	7 30 1	Disulfoton - Use 8 to 23.4 oz. 14G per 1,000 ft. of row.
	Mevinphos Parathion	0.125 - 0.25 0.5 - 1.0	1 10	
Cutworms	Carbaryl Diazinon	2.0 2.0 - 4.0	0 See remarks	<i>Diazinon</i> — Use as a preplant application.
Beet armyworms	Methomyl	0.45 - 0.9	3 See remarks	Methomyl - 1 day if 2 pts. or less is used.
Fall armyworms	Carbaryl Diazinon Methoxychlor	1.2 - 2.0 0.375 - 0.5 1.0 - 3.0	0 1 7 See remarks	Methoxychlor — One day if 1.75 lb. or less is used.
Fruitworm	Azinnhoomothul	0.75 1.50	14	
Hornworm	Carbaryl Fenvalerate	1.0 - 2.0 0.1	0	Fenvalerate — Do not graze or feed to livestock. Use no
	Methomyl	See remarks 0.45 - 0.9	2 Saa ramarka	more than 2.0 lb. Al/acre/season. <i>Methomyl</i> — One day if used at 0.45 lb.
	Naled	1.0	1	
Leafhoppers	Azinphosmethyl Disulfoton Dimethoate	0.5 - 0.75 See remarks	0 30 7	Disulfoton — Use 1.2 to 3.5 fl. oz. per 1.000 ft. of row.
	Mevinphos	0.25 - 0.5	1	
Leafminers	Azinphosmethyl	0.375 - 0.5	0	
	Carbophenothion Diazinon	0.5 - 1.0	7	
	Dimethoate Fenvalerate	0.25 - 0.5 0.1 - 0.2	7 1	Fenvalerate — See remarks under fruitworm.
	Parathion	0.5 - 1.0	10	
Spider mites	Carbophenothion	0.5	7	
	Demeton	0.25	3	Tetradifon - Do not apply more than 2 times during
	Ethion	0.5	2	fruiting season.
	Tetradifon	0.5	0 See remarks	
Stink bugs	Carbaryl Endosulfan	1.0 - 2.0 1.0	0 1	
	Parathion	0.5 - 1.0	10	
Inrips	Azinphosmethyl Parathion	0.5 - 0.75 1.0 - 2.0	0 10	
Tomato pinworm	Azinphosmethyl Carbaryl	0.5 - 0.75 1.0 - 2.0	14 0	Fenvalerate — See remarks under fruitworm.
	renvalerate Methomyl	0.1 - 0.2 See remarks 0.25 - 0.5	1 See remarks	MethomyI — One day before harvest, 2 if more than the 0.5 Ib. of 90 WP is used.
Whitefly	Azinphosmethyl	0.375 - 0.75	0	
	Endosulfan	0.5 (in 100 gal.	1	
	Parathion	0.5 - 1.0	10	

POLICY FOR MAKING INSECT CONTROL SUGGESTIONS

Insect control suggestions made by the Texas Agricultural Extension Service and the Texas Agricultural Experiment Station of The Texas A&M University System are based upon:

- Product effectiveness
- Avoiding residues in excess of allowable tolerances on the crop at harvest
- Avoiding toxicity to humans, animals and desirable plants
- Avoiding adverse side-effects on beneficial predators, parasites, honeybees, fish and other wildlife, plants, animals and humans

Suggested chemicals also must be registered and labeled for use by the U.S. Environmental Protection Agency and the Texas Department of Agriculture. The status of insecticide label clearances is subject to change and changes may have occurred since this publication was printed. County Extension agents and Extension entomologists are notified as these changes occur.

The insecticide USER is always responsible for the effects of pesticide residues on his own crops and livestock, as well as problems caused by drift from his property to other property or crops. Always read and follow all label instructions carefully.

For further information, contact your county Extension agent, area Extension entomologist or state Extension entomologist (AC 409/845-7026), Texas A&M University, College Station, Texas 77843.

The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.

Educational programs conducted by the Texas Agricultural Extension Service serve people of all ages regardless of socioeconomic level, race, color, sex, religion, handicap or national origin.

Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended and June 30, 1914, in cooperation with the United States Department of Agriculture. Zerle L. Carpenter, Director, Texas Agricultural Extension Service, The Texas A&M University System. 8M-4-85, Revision