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Insecticide Suggestions To Control Greenhouse And Floriculture Pests In 1975

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Insecticide Suggestions To Control Greenhouse And Floriculture Pests In 1975

Do not use after 1975

The major crops and their major pests are as follows:

African violets	Cyclamen mites, also spider mites, Pritchard mealybug, occasionally aphids
Azaleas	Spider mites, cyclamen mites, whiteflies, greenhouse thrips, leaf miner, leaf roller
Begonias	Cyclamen mite probably most serious, thrips
Cacti (succulent plants)	Mealybugs, scale insects
Camellias	Aphids, thrips, leaf miners, spider mites
Carnations	Aphids, thrips, spider mites
Chrysanthemums	Aphids, leaf miners (<i>Phytomyza atricornis</i>)
Cyclamens	Cyclamen mite, spider mites, aphids
Foliage plants	Root aphids, foliar aphids, scale insects, mealybugs
Geraniums	Aphids, whiteflies, plume moth (<i>Platyptilia pica</i>)
Lilies	Aphids
Orchids	Orchid fly (<i>Eurytoma orchidearum</i>), slugs
Poinsettias	Mealybug, whitefly, spider mites, scale insects, root aphids
Roses	Spider mites, thrips, aphids, midge, leafrollers
Snapdragons	Spider mites, aphids, cyclamen mite, whiteflies

Pest	Insecticide, miticide	Dosage per 100 gal. spray unless otherwise stated	Remarks
Ants	SPRAYS OR DUSTS		
	chlordane	5% dust or 2½ lb. of 40% W.P.	} Apply 1 lb. of dust or 1 gal. spray per 1,000 sq. ft. soil along walks. Do not apply to foliage.
	diazinon	1 to 2 lb. 50% W.P.	
	dieldrin*	2% dust, 1 lb. of 50% W.P.	
	or 1½ qt. of 18.6% E.C.		

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Pest	Insecticide, miticide	Dosage per 100 gal. spray unless otherwise stated	Remarks
Aphids	AEROSOLS and VAPORS		
	dichlorvos (Vapona)	6 oz. smoke generator for 10,000 cu. ft.; 2 oz of 81% E.C. per 10,000 cu. ft. on steam pipes.	Close greenhouse vents for 2 hours after treatment.
	naled (Dibrom)	2 fl. oz. of 4 lb. E.C. per 10,000 cu. ft. on steam pipes	
	parathion	10% aerosol using 1 lb. per 50,000 cu. ft.	Causes leathery leaves on gardenias; not recommended on asters and white cyclamen.
	sulfotepp (Dithio)	Smoke or 5% aerosol bomb using 1 lb. per 50,000 cu. ft.	
	SPRAYS		
	diazinon	1 lb. 50% W.P. or 1 pt. 50% E.C.	
	endosulfan (Thiodan)	1 lb. 50% W.P. or 1 qt. 24% E.C.	3% dusts may also be used.
	malathion	2 lb. 25% W.P. or 1½ pt. 57% E.C.	Dosage doubled for scale insects. Injury occurs to some crassulas, cucurbits, ferns, petunias, orchids, sweet peas. Phytotoxicity greatest with E. C. Dusts may also be applied.
	SOIL TREATMENT		
	oxydemetonmethyl (Meta-Systox-R)	1½ pt. of 2 lb. E.C. For soil drench use 1 tablespoon in 3 gal.; 3 gal. treats 100 6-inch pots.	Causes leaf scorch on Easter Lily; injury noted on mum varieties: Hurricane, Iceberg, Whitecap, and Pennant.
	aldicarb (Temik)	30-40 oz. Temik 10 G/1000 sq. ft. on soil surface	Should give 8 weeks protection; approved on mums, Gerberas, roses, carnations, Easter lilies, and snapdragons.
Caterpillars (various species)	carbaryl (Sevin)	2 lb. of 50% W.P. or 1 qt. of 80% sprayable	Except for older stages of cabbage looper.
	methoxychlor	2 lb. of 50% W.P.	Preferred for sensitive foliage.
	trichlorfon (Dylox)	2 to 3 lb. of 50% soluble powder	Some injury to certain varieties of carnation and zinnia.
Centipedes, symphylids	lindane*	10 oz. of 25% W.P. per 1,000 sq. ft.	Work into soil. Steam sterilization is also advised.

* Restricted use pesticide in Minnesota.

Pest	Insecticide, miticide	Dosage per 100 gal. spray unless otherwise stated	Remarks
Cutworms	carbaryl	2 lb. of 50% W.P. or 1¼ lb. 80% W.P. or 5% bait	} Soil treatment.
	chlordane	5% to 10% dust, 2 lb. 50% W.P. or 2 pints 45% E.C.	
Cyclamen mites	dicofol (Kelthane)	1 lb. of 35% W.P. 1 pt. of 18.5% E.C.	} Make 2 or 3 applications at 2-week intervals. Use sanitation and isolation during clean-up period.
	endosulfan	2 lb. of 25% W.P. or 1 qt. of 24% E.C.	
Fungus gnats	chlordane	1 qt. of 75% E.C.	} Drench soil for best larval control. Treat soil weekly until infestation is controlled. Surface dusting controls adults.
	malathion	4% dust or 1½ to 2 pts. of 57% E.C.	
	lindane*	10 oz. of 25% W.P. per 10,000 sq. ft.	
Grasshoppers	carbaryl	2 lb. of 80% W.P.	
	chlordane	1 lb. of 50% W.P.	
	malathion	2 pt. of 57% E.C.	
Leafhoppers	carbaryl	2 lb. of 50% W.P.	
	diazinon	½ lb. of 50% W.P.	
Leaf miners and foliar nematodes	diazinon	2 lb. 50% W.P.	
	malathion	1½ pt. of 57% E.C. 2 lb. 25% W.P.	
	oxydemetonmethyl (Meta-Systox-R)	1½ pt. of 2 lb. E.C. Soil drench may be used as given under aphids	
	parathion	1 lb. of 25% W.P. 1 pt. 25% E.C.	Avoid excessive treatment of asters, gardenias, and white cyclamen.
	SOIL TREATMENT aldicarb (Temik)	30-40 oz. of Temik 10 G/1000 sq. ft. on soil surface (½ tsp./6" diam. pot)	Approved on mums and Gerberas.
Leaf rollers	carbaryl (Sevin)	2 lb. of 50% W.P. or 1¼ lb. of 80% W.P.	
	trichlorfon (Dylox)	2 to 3 lb. of 50% soluble powder	Some injury to certain varieties of carnation and zinnia.

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Pest	Insecticide, miticide	Dosage per 100 gal. spray unless otherwise stated	Remarks	
Mealybugs	SPRAYS			
	diazinon	2 lbs. of 50% W.P. or 1 pt. of 50% E.C.		
	lindane*	½ lb. of 25% W.P. or 8 oz. of 20% E.C.		
	malathion	3 lb. of 25% W.P. or 1½ pt. of 57% E.C.		
	parathion	1 lb. of 25% W.P.	Repeat in 3 to 4 weeks.	
	VAPORS, AEROSOLS			
	dichlorvos (Vapona)	6 oz. smoke generator for 10,000 cu. ft. 1 oz. of 81% E.C. per 10,000 cu. ft. on steam pipes		
	malathion	15% bomb using 1 lb. per 50,000 cu. ft. 1 10% bomb at 1 lb. per 50,000 cu. ft.		
	naled	2 fl. oz. of 4 lb. E.C. per 10,000 cu. ft. on steam pipes		
	sulfotepp	15% bomb using 1 lb. per 50,000 cu. ft.		
	SOIL TREATMENT			
	aldicarb (Temik)	30-40 oz. of Temik 10 G/1000 sq. ft. on soil surface (½ tsp./6" diam. pot)	Approved on Poinsettias.	
Plume moth	carbaryl (Sevin)	2 lb. of 50% W.P. or 1 qt. of 80% sprayable	} Principal geranium pest Sprays preferable to aerosols, especially on older larvae.	
	trichlorfon (Dipterex, Dylox)	2-3 lb. of 50% soluble powder		
Roaches	chlordane diazinon	} same as for ants		
Scale insects	diazinon dichlorvos dimethoate (Cygon) malathion parathion sulfotepp	} same as for mealybugs	} 3 or 4 applications, but repeat as necessary. Best control when crawlers are present.	
Slugs, snails	Mesurol	1 lb. of 2% bait per 1000 sq. ft.	Apply once every 2 weeks to soil, using fresh material.	
	metaldehyde, or proprietary baits containing metaldehyde	2 oz. of 15% dust per 100 sq. ft. or 1 oz. of 20% E.C. to cover 100 sq. ft.		
	Zectran	3 tsp. of 2 lb. E.C. per gal. 2% meal bait	Apply 1 gal. mixture per 130-180 sq. ft. soil or turf. 1 lb. per 1200 sq. ft.	

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Pest	Insecticide, miticide	Dosage per 100 gal. spray unless otherwise stated	Remarks	
Sowbugs (pillbugs)	chlordane	5% to 10% dust		
	diazinon	1 lb. of 50% W.P. or 1 pt. of 50% E.C.		
	lindane*	1 lb. of 25% W.P.		
Spider mites	SPRAYS			
	carbophenothion (Trithion)	1 pt. of 4 lb. flowable or 2 lb. of 25% W.P.	Do not treat Crassula and maiden hair fern.	
	chlorobenzilate	1 lb. of 25% W.P. or 1 pt. of 25% E.C.	Not as effective when sulfur is used.	
	dicolfol (Kelthane)	1 lb. of 35% W.P. or 1 pt. of 18.5% E.C.	Incompatible with sulfur.	
	dimethoate (Cygon)	1 to 1½ pt. of 2.67 lb. E.C.		
	malathion	1½ pt. 57% E.C.		
	Morestan	½ lb. of 25% W.P.	Certain rose varieties damaged.	
	Omite	½ lb. of 30% W.P.		
	oxydemetonmethyl (Meta-Systox-R)	1½ pt. of 25% E.C.		
	Pentac	½ lb. of 50% W.P.		
	Plictran	4-6 oz. of 50% W.P.	Certain varieties of mums may be damaged.	
	tetradifon (Tedion)	½ lb. of 50% W.P.		
			1 qt. of 12.3% E.C.	Avoid treatment of White Butterfly and Cinderella roses.
		AEROSOLS		
		chlorobenzilate	10% bomb for 50,000 cu. ft.	
		dichlorvos	6 oz. for 10,000 cu. ft. or paint 1 fl. oz. of 81% E.C. per 10,000 cu. ft. on steam pipes	
		malathion	15% bomb using 1 lb. for 50,000 cu. ft.	
		parathion	10% bomb for 200,000 cu. ft.	
		sulfotepp	15% bomb to 200,000 cu. ft.	
		VAPORS OR SMOKES		
		naled	Paint 1 fl. oz. of 58% E.C. per 10,000 cu. ft. on steam pipes	Corrosive to metals.
		sulfotepp	15% sulfotepp, using 1¼ oz. to 5,000 cu. ft.	
		tetradifon (Tedion)	Paint 10 oz. of 50% W.P. as slurry to steam pipes for 200,000 cu. ft.	
	tetradifon 15% + sulfotepp, 12.5%	Smoke generator 6 oz. for 10,000 cu. ft.		
	SOIL TREATMENT			
	aldicarb (Temik)	30-40 oz. of Temik 10 G/1000 sq. ft. on soil surface (½ tsp./6" diam. pot)	Should control mites for 40-60 days; approved on mums, Poinsettias, Gerberas, roses, carnations, orchids, and snapdragons	
Spittle bugs	endosulfan (Thiodan)	1 lb. of 50% W.P. or 1 qt. of 24% E.C. or 3% dust		
	lindane*	½ lb. of 25% W.P. or 8 oz. of 20% E.C.		

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Pest	Insecticide, miticide	Dosage per 100 gal. spray unless otherwise stated	Remarks
Springtails	SOIL TREATMENT		
	chlordane	1 lb. of 40% W.P. or ½ pt. of 75% E.C.	
	diazinon	1 lb. of 50% W.P. 1 pt. of 50% E.C. 2% dust watered in	
Symphylids (see Centipedes)	carbaryl (Sevin)	1 qt. of 80% sprayable 1 lb. of 4 lb. flowable	
Tarnished plant bugs and other plant bugs	carbaryl (Sevin)	2 lb. of 50% W.P.	
Thrips	diazinon	1 lb. of 50% W.P. 1 pt. of 50% E.C., 2% dust	
	heptachlor*	1 lb. of 25% W.P. or 1 pt. of 25% E.C.	
	lindane*	½% to 1% through evaporative pads	
	SOIL TREATMENT aldicarb (Temik)	30-40 oz. Temik 10 G/ 1000 sq. ft. soil surface (½ tsp./6" diam. pot)	Approved on mums, Poinsettias, Gerberas. Aldicarb only recommended for thrips on Chrysanthemums.
Whiteflies	SPRAYS		
	azinphosmethyl (Guthion)	1½ pt. of 2 lb. E.C. 1 lb. of 50% W.P.	Applications should be made at 10- 14 day intervals until infestation is under control. Azinphosmethyl will also control aphids.
	diazinon	2 lb. of 50% W.P.	
	endosulfan (Thiodan) or endosulfan plus malathion or parathion resmethrin	Same as for aphids 1 lb. of 50% W.P. plus 3 lb. of 25% W.P. or 1 lb. of 25% W.P. 1 pt. of 2 lb. E.C.	See remarks under aphids. Do not use on food crops
	VAPORS, AEROSOLS		
	dichlorvos (Vapona)	6 oz. for 10,000 cu. ft. or paint 1 fl. oz. of 81% E.C. per 10,000 cu. ft. on steam pipes	Close greenhouse vents for 2 hours after application.
	endosulfan (Thiodan)	1 lb. 10% aerosol per 50,000 cu. ft.	
	sulfotepp (Dithio)	5% bomb using 1 lb. per 50,000 cu. ft.	
	SOIL TREATMENT aldicarb (Temik)	30-40 oz. Temik 10G/ 1000 sq. ft. soil surface (½ tsp./6" diam. pot)	Should control white flies for 3 to 4 weeks.

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Resistance of Certain Aphids (particularly Green Peach Aphid) and Red Spider Mites

There appears to be no easy way of minimizing the development of resistance except to minimize or avoid using certain chemicals. On the other hand there are a few guidelines which may be helpful, such as:

- (1) Prevent introduction of new strains from other sources by careful inspection of the plants upon receipt; preferably isolate for a time before a treatment; if an infestation is present give a thorough treatment before permitting the plants to be mixed with the others.
- (2) Keep conditions as cool and unfavorable for the aphids and mites as possible without interfering with the growing conditions of the plants.
- (3) Make each treatment thorough.
- (4) Alternate effective insecticides; change from one type of chemical grouping to another. In the case of aphids, there are three major insecticide groups. With spider mites, there are more possibilities. Materials used along with their classifications are given below:

Aphids: (1) *Chlorinated hydrocarbons*—endosulfan (Thiodan), lindane. (2) *Organophosphates*—carbophenothion (Trithion), demeton (Systox), dichlorvos (DDVP), diazinon, dimethoate (Cygon), malathion, naled (Dibrom) oxydemetonmethyl (Meta Systox R), parathion, phorate (Thimet), Sulfotepp (Dithio). (3) *Carbamate*—aldicarb (Temik).

Red Spider Mites: (1) *Chlorinated hydrocarbons*—chlorobenzilate, dicofol (Kelthane), Pentac; (2) *Organophosphates*—carbophenothion (Trithion), demeton, dichlorvos, dimethoate, naled, oxydemetonmethyl, parathion, phorate, sulfotepp; (3) *Carbamate*—aldicarb (Temik). (4) *An organic carbonate*—Moreston; (5) *Sulfur compounds (not phosphates)*—tetradifon (Tedion), (6) *Organotin compound*—Plictran.

Toxicity and Hazard

The hazard from insecticides is not only dependent upon the toxicity of the chemical but how it is used and what form of the insecticide might be contacted.

For human safety when using aldicarb (Temik 10 G) use rubber gloves and a respirator when in an enclosure; never use treated plants for food or feed purposes; do not market potted plants within 4 weeks after treatment; wait 100 days before planting food crops in treated soil.

The following table illustrates relative hazard differences due to the physical state (++++ = very hazardous, + least hazardous.)

Physical State	Lungs	Hazard through skin	By Mouth
Droplets of:			
Emulsions	++	+++	+
Wettables or Flowables	++	++	+
Solutions	++	+++	+
Smokes	+++	+	+
Vapors (aerosols)	++++	+	+
Dusts	+++	++	+
Granules	+	++	++

The highly toxic (less than 5 gram or 1/6 oz. active ingredients for a man):

phorate (Thimet)	mevinphos (Phosdrin)	sulfotepp
demeton (Systox)	carbophenothion (Trithion)	
endrin	azinphosmethyl (oral) (Guthion)	
parathion	aldicarb (Temik)	

The moderately toxic: (1/6 oz. to 2 oz. for a man)

aldrin	heptachlor	dichlorvos
chlordane	lindane	diazinon (oral)
DDT	endosulfan	naled (Dibrom)
dieldrin	toxaphene	oxydemetonmethyl (oral)
azinphosmethyl (dermal) (Guthion)		(Meta-Systox-R)

