



2012 Plant Health Guide



Managing pests, diseases and weeds requires many tools, and there are myriad products in the market to help. Use this guide to choose the correct pesticide, insecticide and herbicide for your situation. The information in this guide is not a substitute for the label. Always read and understand all information presented on the label before application.

Managing chemical resistance is another important step in your quest to control pests, diseases and weeds.



To manage pesticide resistance:

- Reduce pesticide use by practicing Integrated Pest Management and prevent pest outbreaks
- Rotate chemicals by class (either in sequential applications or by pest generations)
- Manage pesticide use rate. Use lowest dose that provides control
- Spot treat: apply pesticides only to infested plants to maintain susceptible pest populations
- Use an economic or aesthetic threshold to make control decisions. Tolerate low pest populations
- Use soaps, oils and biologicals when appropriate to avoid resistance pressure

Keep good spray records and review them each year. And when in doubt, contact your local extension agent for help identifying a problem. For more information on IPM, visit <http://edis.ifas.ufl.edu/ig144>. **NM**

INSECTICIDES



MOA GROUP	Class	Common name	Trade Name	REI	Use sites	Company	
1A	Carbamates	Carbaryl	Sevin	12	N	Bayer Environmental Science	
		Methiocarb	Mesuroil	24	GH/N	Gowan Co.	
1B	Organophosphates	Acephate	OrtheneTT&O	24	GH/N	Amvac Chemical Corp.	
		Chlorpyrifos	DuraGuard ME	24	GH/N	BASF	
			Dursban50 WP	24	N	Dow AgroSciences LLC	
			Dimethoate	Dimethoate 267	48	N	Arysta LifeScience
				AllPro Cygon 2E	48	N	Value Garden Supply
				Dimethoate 4EC	48	N	Helena Chemical Co.
			Naled	Dibrom	varies	GH	Amvac ChemicalCorp.
	Malathion	Gowan Malathion 8F	12	N	Gowan Company		

INSECTICIDES

MOA GROUP	Class	Common name	Trade Name	REI	Use sites	Company
		Methidathion	Supracide	3 days	N	Gowan Company
		Oxydemeton-methyl	MSR Spray Concentrate	10 days	N	Gowan Company
		Phosmet	Imidan 70W	24	N	Gowan Company
2B	Phenylpyrazoles	Fipronil	TopChoice	24	N	Bayer Environmental Science
3	Pyrethroids	Bifenthrin	Talstar	12	GH/N	FMC Corp.
			OnyxPro	12	N	FMC Corp.
			AttainTR	12	GH	BASF
		Cyfluthrin	Decathlon	12	GH/N	OHP Inc.
		Fenpropathrin	Tame	24	GH/N	Valent USA Corp.
		Fluvalinate	Mavrik Aquaflow	12	GH/N	Wellmark International
		Lambda-Cyhalothrin	Scimitar GC	24	GH/N	Syngenta
		Permethrin	Astro	12	GH	FMC Corp.
			Permethrin 3.2 EC	12	GH/N	Helena Chemical Co.
			Ambush	12	GH/N	Amvac Chemical Corp.
	Botanicals	Pyrethrins	Pyrethrum TR	12	GH	BASF
			Pyreth-It	12	GH/N	BASF
4A	Neonicotinoids	Acetamiprid	TriStar	12	GH/N	Cleary Chemical Corp.
		Dinotefuran	Safari	12	GH/N	Valent USA Corp.
		Imidacloprid	Marathon	12	GH/N	OHP Inc.
		Thiamethoxam	Flagship	12	GH/N	Syngenta
5	Spinosyns	Spinosad	Conserve	4	GH/N	Dow AgroSciences LLC
			Entrust	4	GH/N	Dow AgroSciences LLC
6	Glycosides	Abamectin	Avid	12	GH/N	Syngenta
		Milbemectin	Ultiflora	12	N	Gowan Company
7A	Juvenile hormone mimics	s-Kinoprene	Enstar AQ	12	GH	Wellmark International
7B		Fenoxycarb	Preclude TR	12	GH	BASF
			Award	12	N	Syngenta
7C	Pyridine insect growth regulators	Pyriproxyfen	Distance	12	GH/N	Valent USA Corp.
9A	Pyridine azomethines	Pymetrozine	Endeavor	12	GH/N	Syngenta
9B	Pyridine carboxamides	Fonicamid	Aria	12	GH/N	FMC Corp.
10A	Tetrazines	Clofentezine	Ovation	12	GH/N	Everris NA, Inc
	Thiazolidinones	Hexythiazox	Hexygon DF	12	GH/N	Gowan Company
10B	2, 4 -Diphenyloxzoline Derivatives	Etoxazole	TetraSan	12	GH/N	Valent USA Corp.
			Beethoven TR	4-24*	GH	BASF
11	Biopesticides	<i>Bacillus thuringiensis</i> Kurstaki	DiPel Pro DF	4	GH/N	Valent USA Corp.

INSECTICIDES

MOA GROUP	Class	Common name	Trade Name	REI	Use sites	Company
			Deliver	4	GH/N	Certis USA LLC
			Javelin WG	4	GH/N	Certis USA LLC
		<i>B. thuringiensis</i> Israelensis	Gnatrol	4	GH/N	Valent USA Corp.
12	Organotinols	Fenbutatin-oxide	ProMITE	48	GH/N	SePRO Corp.
13	Pyrroles	Chlorfenapyr	Pylon	12	GH	BASF
15	Benzoyl Urea Insect Growth Regulators	Diflubenzuron	Adept	12	GH	OHP Inc.
			Dimilin SC	12	GH/N	OHP Inc.
			Novaluron	12	GH/N	OHP Inc.
16		Buprofezin	Talus	12	GH/N	SePRO Corp.
17	Triazine Insect Growth Regulators	Cyromazine	Citation	12	GH/N	Syngenta
18	Diacylhydrazine	Tebufenozide	Confirm	4	N	Gowan Company
		Methoxyfenozide	Intrepid	4	GH/N	Dow AgroSciences LLC
20A	Trifluoromethyl Aminohydrazone	Hydramethylnon	Amdro Pro	12	N	BASF
20B	Napthoquinone Derivative	Acequinocyl	Shuttle O	12	GH/N	OHP Inc.
21A	METI Acaricides and Insecticides	Pyridaben	Sanmite	12	GH/N	Gowan Company
		Fenpyroximate	Akari	12	GH	SePRO Corp.
		Tolfenpyrad	Hachi-Hachi	12	GH	SePRO Corp.
		Fenazaquin	Magus	12	GH/N	Gowan Company
23	Tetronic acids	Spiromesifen	Judo	12	GH/N	OHP Inc.
		Spirotetramat	Kontos	24	GH/N	OHP Inc.
UN	Carbazates	Bifenazate	Floramite	12	GH/N	OHP Inc.
	Biopesticide Insect Growth Regulators	Azadirachtin	Azatin XL	4	GH/N	OHP Inc.
		Pyridalyl	Overture	12	GH	Valent USA Corp.
M	Biopesticides	<i>Beauveria bassiana</i>	BotaniGard	4	GH/N	BioWorks Inc.
			Mycotrol O	4	GH/N	BioWorks Inc.
		<i>Paecilomyces fumorosoroseus</i>	PFR-97	4	GH/N	Certis USA LLC
	Oils	Clarified hydrophobic extract of neem oil	Triact 70	4	GH/N	OHP Inc.
		Paraffinic oil	Ultra-Pure Oil	4	GH/N	BASF
		Petroleum	Suffoil-X	4	GH/N	BioWorks Inc.
	Soaps	Potassium salts of fatty acids	AllPro Insecticidal Soap 40%	12	GH/N	Value Garden Supply
			M-Pede	12	GH/N	Gowan Company

N = nursery; GH = greenhouse

FUNGICIDES



MOA GROUP	Class	Common name	Trade Name	REI	Use sites	Company	
1	Thiophanates	Thiophanate-methyl	OHP 6672	12	GH/N	OHP Inc.	
			3336	12	GH/N	Cleary Chemical Corp.	
			AllBan	12	GH/N	Everris NA Inc.	
2	Dicarboximides	Iprodione	OHP Chipco 26019 N/G	12	GH/N	OHP Inc.	
			Iprodione Pro	12	GH/N	BASF	
3	Imidazole	Triflumizole	Terraguard	12	GH/N	OHP Inc.	
			Fungaflor	24	GH	BASF	
	Pyrimidine	Fenarimol	Rubigan	12	N	Gowan Co.	
			Triazole (includes conazole)	Propiconazole	Banner MAXX II	12	N
	Strider	24			N	Cleary Chemical Corp.	
Metconazole	Tourney	12	N	Valent USA Corp.			
Demethylation inhibitors (DMI fungicides)		Triadimefon	Strike 50WDG	12	GH/N	OHP Inc.	
			Myclobutanil	Eagle 20EW	24	GH/N	Dow AgroSciences LLC
4	Acylamine	Metalaxyl-M (=Mefanoxam)	Subdue MAXX	0-48	GH/N	Syngenta	
5	Piperadines	Piperalin	Pipron	12	GH	SePro Corp.	
7	Phenyl-Benzamides	Flutolanil	ProStar	12	GH/N	Bayer Environmental Science	
11	Strobilurins	Trifloxystrobin	Compass O	12	GH/N	OHP Inc.	
			Fluoxastrobin	Disarm O	12	GH/N	OHP Inc.
			Azoxystrobin	Heritage	4	GH/N	Syngenta
			Kresoxim-methyl	Cygnus	12	GH/N	BASF
			Pyraclostrobin	Insignia	12	GH/N	BASF
Imidazolinones	Fenamidone	FenStop	12	GH	OHP Inc.		
12	Phenylpyrrole (PP fungicides)	Fludioxonil	Medallion	12	GH/N	Syngenta	



Pesticide storage tips

- Diane Brown, Michigan State University Extension

Whether your pesticide storage area is an entire building, a room, a closet or a cabinet devoted to pesticide storage, keep it locked to prevent unauthorized entry, vandalism or theft.

Post warning signs on doors and windows to let people know that pesticides are stored inside.

“No Smoking” signs should also be posted, since many pesticides are flammable.

Regularly check containers for leaks. Transfer the contents of leaking containers to a sound container with the exact same formulation and label. Follow label recommendations for disposal of damaged containers.

Store pesticides in their original containers with the labels intact.

Put the heaviest containers and liquids on the lowest (preferably metal) shelves. Be sure that shelves are sturdy enough to handle the load.

To avoid cross-contamination, store each type of pesticide (herbicides, insecticides, fungicides) in a separate location or on a separate shelf within the storage unit.

Store pesticides away from food, pet food, feed, seed, fertilizers, veterinary supplies and flammable materials.

Outdated or unusable pesticides can be taken to a community “clean sweep” day for free, safe disposal. Check with your local county Extension office for a list of dates and locations. **NM**

 **Want to know more?**
Learn more at www.epa.gov/pesticides/regulating/storage.htm

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 NemaShield® fungus gnat larval control
 NemaShield® HB black vine weevil control
 SuffOil-X® (OMRI Listed)insect control
 Molt-X® (OMRI Listed)insect control
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FUNGICIDES

MOA GROUP	Class	Common name	Trade Name	REI	Use sites	Company
			Mozart TR	6 to 12	GH	BASF
14	Aromatic hydrocarbon	PCNB	Terraclor	12	GH/N	OHP Inc.
	Thiadiazole	Etridiazole	Terrazole	12	GH/N	OHP Inc.
			Truban	12	GH/N	Everris NA Inc.
17	Hydroxanilide	Fenhexamid	Decree	12	GH/N	SePRO Corp.
19	Polyoxins (biopesticides)	Polyoxin-D	Veranda O	4	GH/N	OHP Inc.
			Affirm	4	GH/N	Cleary Chemical Corp.
21	Cyano-imidazole	Cyazofamid	Segway	12	GH/N	FMC Corp.
28	Carbamate	Propamocarb	Banol	24	GH/N	Bayer Environmental Science
33	Ethyl Phosphonates	Fosetyl-AI	Aliette	12	GH/N	OHP Inc.
	Phosphite	Phosphoric acid	Alude	4	GH/N	Cleary Chemical Corp.
40	Cinnamic Acid Amides	Dimethomorph	Stature SC	12	GH/N	BASF
43	Pyridinemethyl-benzamides	Fluopicolide	Adorn	12	GH/N	Valent USA Corp.
M1	Copper, complex	Copper sulfate	Camelot	12	GH/N	SePRO Corp.
			Phyton 27	24	GH/N	Phyton Corp.
	Copper, fixed	Copper hydroxide	CuPro 2005 T/N/O	24	GH/N	SePRO Corp.
M3	Dithiocarbamates (and relatives)	Mancozeb	Dithane	24	GH/N	Dow AgroSciences LLC
			Fore	24	GH/N	Dow AgroSciences LLC
			Junction	24	GH/N	SePRO Corp.
			Pentathlon	24	GH/N	SePRO Corp.
		Manganese + zinc	Protect DF	24	GH/N	Cleary Chemical Corp.
M4	Phthalimides	Captan	Captan 80WDG	0 to 48	GH/N	Arysta LifeScience
			Captan 50W	96	GH/N	Arysta LifeScience
M5	Chloronitriles	Chlorothalonil	Daconil Ultrex	12	GH/N	Syngenta
			AllPro Exotherm Termil	varies	GH	Value Garden Supply
NC	Biopesticide	<i>Trichoderma harzianum</i> T22	PlantShield HC	0	GH/N	BioWorks Inc.
			RootShield	0	GH/N	BioWorks Inc.
		<i>T. virens</i> GL21	SoilGard 12G	4	GH/N	OHP Inc./Certis USA
		<i>Bacillus subtilis</i> GB03	Companion	4	GH/N	Growth Products
		<i>B. subtilis</i> QST713	Cease	4	GH/N	BioWorks Inc.
		<i>Streptomyces lydicus</i> WYEC108	Actinovate SP	4	GH/N	Natural Industries Inc.
	Bicarbonate	Potassium bicarbonate	Armcarb 100	4	GH/N	Helena Chemical Co.

FUNGICIDES

MOA GROUP	Class	Common name	Trade Name	REI	Use sites	Company
			MilStop	1	GH/N	BioWorks Inc.
	Hydrogen Dioxide/Peroxide		ZeroTol	0	GH/N	Biosafe Systems
			Xeroton X3	0 to 2	GH/N	Phyton Corp.
	Oils	Clarified hydrophobic extract of neem oil	Triact 70	4	GH/N	OHP Inc.
		Petroleum oil	Suffoil-X	4	GH/N	BioWorks Inc.
	Soaps	Potassium salts of fatty acids	M-Pede	12	GH/N	Gowan Co.
	Botanical Extract	<i>Reynoutria sachalinensis</i>	Regalia	4 to 24	GH	Marrone Bio Innovations
1+2	Thiophanate + Dicarboxamide	Thiophanate + Iprodione	26/36	12	GH/N	Cleary Chemical Corp.
1+14	Thiophanate + Thiadiazole	Thiophanate-methyl + Etridiazole	Banrot	12	GH/N	Everris NA Inc.
1+M3	Thiophanate + Dithiocarbamate	Thiophanate-methyl + Mancozeb	Zyban	24	GH/N	Everris NA Inc.
1+M5	Thiophanate + Chloronitrile	Thiophanate-methyl + Chlorothalonil	Spectro 90	12	GH/N	Cleary Chemical Corp.
3+M3	Demethylation inhibitor + Dithiocarbamate	Myclobutanil + Mancozeb	Clevis	24	GH/N	ProKoz
3+M5	Demethylation inhibitor + Chloronitrile	Propiconazole + Chlorothalonil	Concert II	12	N	Syngenta
4+12	Acylalanine + Phenylpyrrole	Mefanoxam + Fludioxonil	Hurricane	48	GH	Syngenta
7+11	Pyridine Carboxamide + Strobilurin	Boscalid + Pyraclostrobin	Pageant	12	GH/N	BASF
9+12	Anilo-pyrimidine + Phenylpyrrole	Cyprodinil + Fludioxinil	Palladium	12	GH/N	Syngenta

N = nursery; GH = greenhouse



PHOTOS BY JIM CHATFIELD; JOE BOGGS

HERBICIDES



MOA Group	Class	Common name	Trade name	REI	Use sites	Company
1	Aryloxyphenoxy propionate 'FOPs'	fenoxaprop-p-ethyl	Acclaim Extra	24	PO; A, P	Bayer Environmental Science
		fluazifop-P-butyl	Fusilade II	12	PO; A, P	Syngenta
	Cyclohexanedione 'DIMs'	clethodim	Envoy Plus	24	PO; A, P	Valent USA Corp.
sethoxydim		Segment	12	PO; A, P	BASF	
2	Imidazolinone	imazaquin	Image	12	PR/PO; A, P, BW, S	BASF
3	Pyridine	dithiopyr	Dimension	12	PR; A, BW	Dow AgroSciences LLC
		pronamide	Kerb	24	PR/PO; A, BW	Dow AgroSciences LLC
	Dinitroaniline	pendimethalin	Pendulum	24	PR; A, BW	BASF
		Corral	24	PR; A, BW	Everris NA Inc.	
		prodiamine	Barricade	12	PR; A, BW	Syngenta
	Benzoic acid	oryzalin	Surflan WDG	12	PR; A, BW	United Phosphorus
		DCPA	Dacthal	12	PR; A, BW	Amvac Chemical Corp.
4	Pyridine carboxylic acid	clopyralid	Lontrel	12	PO; WO	Dow AgroSciences LLC
5	Triazine	simazine	Princep	12	PR; A, BW	Syngenta
6	Benzothiadiazinone	bentazon	Basagran T/O	48	PO; BW, S	BASF
9	Glycine	glyphosate	Roundup Pro	4	PO; A, P, BW (GH)	Monsanto
		Touchdown Pro	12	PO; A, P, BW (GH)	Syngenta	
10	Phosphinic acid	glufosinate	Finale	12	PO; MA, P (GH)	Bayer
12	Pyridazinone	norflurazon	Predict	12	PR; A, BW	Syngenta

HERBICIDES

MOA Group	Class	Common name	Trade name	REI	Use sites	Company
14	Diphenylether	oxyfluorfen	Goal	24	PR; PO, A, BW	Dow AgroSciences LLC
			GoalTender	24	PR; PO, A, BW	Dow AgroSciences LLC
	Oxadiazole	oxadiazon	Ronstar	12	PR; A, BW	Bayer Environmental Science
	N-phenylphthalimides	flumioxazin	BroadStar	12	PR; A, BW	Valent USA Corp.
SureGuard			12	PR; PO, A, BW	Valent USA Corp.	
15	Acetamide	napropamide	Devrinol	12 to 14	PR; A, BW	United Phosphorus
	Chloroacetamide	s-metolachlor	Pennant Magnum	24	PR; A, BW	Syngenta
		dimethenamid-P	Tower	12	PR; A, BW, S	BASF
20	Nitrile	dichlobenil	Casoron	12	PR; A, P	OHP Inc.
21	Benzamide	isoxaben	Gallery	12	PR; A, BW	Dow AgroSciences LLC
22	Bipyridylum	paraquat	Gramoxone Inteon	12 to 24	PO; MA, P, BW	Syngenta
		diquat	Reward	24	PO; MA, P (GH)	Syngenta
27	Other	dazomet	Basamid	24	SF; MA, P	Certis USA LLC
		metam	Vapam	48	SF; MA, P	Amvac Chemical Corp.
		pelaronic acid	Scythe	12	PO; MA, P (GH)	Gowan Co.
3+3	Dinitroaniline + Dinitroaniline	benefin + oryzalin	XL 2G	24	PR; A, BW	Helena Chemical Co.
3+14	Diphenylether + Dinitroaniline	oxyfluorfen + pendimethalin	OH2	24	PR; A, BW	Everris NA Inc.
		oxyfluorfen + prodiamine	Biathlon	24	PR; A, BW	OHP Inc.
		oxyfluorfen + oryzalin	Rout	24	PR; A, BW	Everris NA Inc.
		oxadiazon + prodiamine	RegalStar II	12	PR; A, BW	Regal Chemical Co.
		oxadiazon + pendimethalin	Jewel	12	PR; A, BW	Everris NA Inc.
3+15	Chloroacetamide + Dinitroaniline	dimethenamid-P + pendimethalin	Freehand	24	PR; A, BW, S	BASF
14+14	Diphenylether + Oxadiazole	oxyfluorfen + oxadiazon	Regal O-O	24	PR; A, BW	Regal Chemical Co.
3+21	Benzamide + Dinitroaniline	isoxaben + trifluralin	Snapshot TG	12	PR; A, BW	Dow AgroSciences LLC
3+14+21	Benzamide + Diphenylether + Dinitroaniline	isoxaben + oxyfluorfen + trifluralin	Showcase	12	PR; A, BW	Dow AgroSciences LLC

PO = postemergence; PR = preemergence; SF = soil fumigant; GH = registered for greenhouse use; A = annual grasses; BW = broadleaf weeds; WO = certain woody ornamentals; P = perennials; MA = most annuals; S = sedges