

17 Appendices

17.1 Pesticide Data

Table 17.1.1 Common names, product names, formulations, and days-to-harvest for pesticides used on tree fruits.

Common Names/ Products Formulations	DAYS TO HARVEST (A)					
	<i>Apples</i>	<i>Apricots</i>	<i>Cherries</i>	<i>Peaches</i>	<i>Pears</i>	<i>Plums</i>
<i>Insecticides and Acaricides</i>						
*abamectin						
*Agri-Mek, *Temprano 0.15EC	28	—	—	—	28	21
*Abba 0.15EC	28	—	—	—	28	21
acequinocyl						
Kanemite 15SC	14	—	—	—	14	—
acetamiprid						
Assail 30SG	7	7	7	7	7	7
(§)azadirachtin						
§Neemix 4.5L, §Aza-Direct 1.2L, Azatin XL 0.27EC	0	0	0	0	0	0
*azinphos-methyl						
*Guthion 50WS	14(A)	—	15	—	14	—
bifentate						
Acramite 50WS	7	—	—	3	7	3
*bifenthrin						
*Bifenture 2EC, *Brigade 10WS, 2 EC, *Fanfare 2EC	—	—	—	—	14	—
§Bt (<i>Bacillus thuringiensis</i>)						
Deliver 18WG	0	0	0	0	0	0
Dipel 10.3 DF	0	0	0	0	0	0
Biobit 2.IFC	0	0	0	0	0	0
Javelin 7.5WDG	0	0	0	0	0	0
Agree 3.8 WS	0	—	—	0	0	0
buprofezin						
Centaur WDG	14	14	14	14	14	14
buprofezin & flubendiamide						
Tourismo	14	14	14	14	14	14
Carbaryl						
Sevin 4F, 4EC	3	3	3	3	3	3
chlorantraniliprole						
Altacor 35WDG	5	10	10	10	5	10
chlorantraniliprole & thiamethoxam						
Voliam Flexi WDG	35* (60 if adjuvant used)	14	14	14	35 (60 with adjuvant)	14
chlorantraniliprole & cyhalothrin						
Voliam Xpress WDG	21	14	14	14	35 (60 with adjuvant)	14
chlorpyrifos						
Lorsban Advanced	PB/28(A)	—	21	14	PB	PB
*Lorsban 4EC	PB/28(A)	—	21	14	PB	PB
Lorsban 75WG	PB/28(A)	—	14 or 21(C)	14	PB	PB
clofentezine						
Apollo 4SC	45	21	21	21	21	—

Table 17.1.1 Common names, product names, formulations, and days-to-harvest for pesticides used on tree fruits.

Common Names/ Products Formulations	DAYS TO HARVEST (A)					
	Apples	Apricots	Cherries	Peaches	Pears	Plums
<i>Insecticides and Acaricides (continued)</i>						
clothianidin						
Clutch 50 WDG	7	—	—	—	7	—
Belay 2.1	7	—	—	21	7	—
*cyfluthrin						
*Baythroid XL 1E, 2EC, *Leverage 2.7SE	7	7	7	7	7	7
*diazinon						
*Diazinon 50WP, AG600	21/PF(A)	21	21	21	21	21
deltamethrin						
*Battalion 1.5 EC, *Battalion 0.2 EC *Delta Gold 1.56 EC	21	—	—	—	21	—
dimethoate						
Dimethoate 400, 4EC	—	—	—	—	28	—
*emamectin benzoate						
*Proclaim 5SG	14	—	—	—	14	—
*endosulfan						
*Thionex 50WP	21	—	21(F)	21/30	20	—
*Thionex 3EC	21	—	21(F)	21/30	7	—
*esfenvalerate						
*Asana XL 0.66EC	21	14	14	14	28	14
etoxazole						
Zeal 72WS	14	7	7	7	14	7
*fenbutatin-oxide, hexakis						
*Vendex 50WP	14	—	14	14	14	14
*fenpropathrin						
*Danitol 2.4EC	14	3	3	3	14	3
fenpyroximate						
Portal 0.4EC	14	—	—	—	14	—
flonicamid						
Beleaf 50SG	21	14	14	14	21	14
flubendiamide						
Belt SC	14	7	7	7	14	7
*gamma-cyhalothrin						
*Proaxis 0.5CS	21	14	14	14	21	14
§granulosis virus						
Carpovirusine 0.99SC	0	—	—	—	0	—
Cyd-X 0.06SC	0	—	—	—	0	0
hexythiazox						
Savey 50DF	28	28	28	28	28	28
Onager 1 EC	28	7	7	7	28	7
imidacloprid						
Provado 1.6F, *Leverage 2.7SE	7	0	7	0	7	7
	7	7	7	7	7	7
indoxacarb						
Avaunt 30 WDG	14	14	14	14	28	14

Table 17.1.1 Common names, product names, formulations, and days-to-harvest for pesticides used on tree fruits.

Common Names/ Products Formulations	DAYS TO HARVEST (A)					
	Apples	Apricots	Cherries	Peaches	Pears	Plums
Insecticides and Acaricides (continued)						
§kaolin						
Surround 95WP	0	0	0	0	0	0
*lambda-cyhalothrin						
*Lambda-Cy 1CS, *Taiga-Z 1CS, *Warrior 1CS, *Warrior II 2.08CS	21	14	14	14	21	14
malathion						
Malathion 57EC, 5EC	—	7	3	7	—	—
*methidathion						
*Supracide 2EC, 25WP	PB	PB	PB	PB	PB	PB
*methomyl						
*Lannate 2.4L, 90SP	14	—	—	4	7	—
methoxyfenozide						
Intrepid 2F	14	—	—	—	14	—
novaluron						
Rimon 0.83 EC	14	8	—	8	—	8
*oxamyl						
*Vydate 2L	14	—	—	—	14	—
*permethrin						
*Ambush 25WP,*Perm-Up 3.2EC	PF	—	3	14	PB	—
*Pounce 3.2EC, 25WP	PF	—	3	14	PB	—
oil						
JMS Stylet Oil, Omni Oil 6E, Purespray Spray Oil	0	0	0	0	0	0
phosmet						
Imidan 70WP, 70WS	7	14	7 (C)	14	7	7
potassium fatty acids						
§Des-X, §M-Pede	0	0	0	0	0	0
See Des-X label about possible phytotoxicity after fruit formation on pears, cherries, and smooth-skinned stone fruit.						
(§)pyrethrin/rotenone						
§PyGanic 1.4 EC	0	0	0	0	0	0
Pyrenone 6.0% EC	0	0	0	0	0	0
pyridaben						
Nexter 75WS	25	PH	PH	7	7	7
pyriproxyfen						
Esteem 35WP	45	14	14	14	45	14
rynaxypyr (see chlorantraniliprole)						
spinetoram						
Delegate 25WG	7	14	7	14	7	7
(§)spinosad						
§Entrust 80WP	7	14	7	14	7	7
spirodiclofen						
Envidor 2 SC	7	7	7	7	7	7
spirotetramat						
Movento 240SC	7	7	7	7	7	7

Table 17.1.1 Common names, product names, formulations, and days-to-harvest for pesticides used on tree fruits.

Common Names/ Products Formulations	DAYS TO HARVEST (A)					
	<i>Apples</i>	<i>Apricots</i>	<i>Cherries</i>	<i>Peaches</i>	<i>Pears</i>	<i>Plums</i>
<i>Insecticides and Acaricides (continued)</i>						
thiacloprid						
Calypso 4F	30	—	—	—	30	—
thiamethoxam						
Actara 25WDG	35	—	—	—	35	—
zeta cypermethrin						
*Mustang Max EC	14	14	14	14	14	14
<i>Fungicides and Bactericides</i>						
azoxystrobin						
Abound 2.08F	—	0	0	0	—	0
§ <i>Bacillus subtilis</i>						
Serenade ASO	0	0	0	0	0	0
captan						
Captan 50WP, 80WDG, Captec 4L	0	0	0	0	—	0
chlorothalonil						
Bravo Weather Stik, Ultrex Echo 720, 90DF, Chloronil 720, Concorde, Equus, Applause DF, 720	—	SS	SS,PH	SS	—	SS
(§)copper hydroxide						
Kocide 2000, 4.5LF, 101, DF §Champ Formula-2. §NuCop 50DF	HIG	BL	BL,PH (C)	21	BL	BL
copper oxychloride sulfate						
C-O-C-S WDG	GT	PF	PF,PH (C)	BL,PF	BL	BK,PF
copper sulfate						
Cuprofix Ultra Disperss 40DF, Basicop	2C	BL	BL, PH	SS	BL	BL
cyprodinil						
Vanguard WG	72	BL	BL(C)	BL	72	BL
DCNA						
Botran 75WP	—	10	10(D)	10	—	BL
difenoconazole						
Inspire Super MP	72	—	—	—	72	—
dodine						
Syllit 65WP, FL	7	—	0, PH	15	—	—
fenarimol						
Vintage 1SC	30	—	0	—	30	—
fenbuconazole						
Indar 2F	14	0	0, PH	0	—	—
fenhexamid						
Elevate 50WDG	—	0	0	0	0	0
ferbam						
Ferbam Granuflo	7	—	0	21	7	—

Table 17.1.1 Common names, product names, formulations, and days-to-harvest for pesticides used on tree fruits.

Common Names/ Products Formulations	DAYS TO HARVEST (A)					
	Apples	Apricots	Cherries	Peaches	Pears	Plums
Fungicides and Bactericides(continued)						
fosetyl-Al						
Aliette WDG	14	(B)	(B)	(B)	14	(B)
§hydrogen dioxide (hydrogen peroxide)						
OxiDate	0	0	0	0	0	0
iprodione						
Rovral 50WP, 4 Flowable, Iprodione 4L, AG	—	PF	PF	PF	—	PF
kresoxim-methyl						
Sovran 50WG	30	—	—	—	30	—
(§)lime sulfur						
Allpro Lime Sulfur, §Rex lime sulfur solution Miller Lime Sulfur Solution Sulforix Lime Sulfur	0	—	0	0	0	0
mancozeb						
Manzate 75DF, Flowable Penncozeb 75DF, 80WP	BL,77(A)	—	—	—	BL,77(A)	—
mancozeb + copper hydroxide						
ManKocide	BL	—	—	—	BL	—
mefanoxam						
Ridomil Gold 4EC	GT, PH	GT	GT	GT	—	GT
metiram						
Polyram 80WP	BL,77(A)	—	—	—	—	—
myclobutanil						
Rally 40WSP	14	0	0	0	—	0
(§)oxytetracycline						
§Mycoshield 17WP, Fireline 17WP	60	—	—	21	60	—
<i>Pantoea agglomerans</i> strain E325						
Bloomtime Biological FD	PF	—	—	—	PF	—
phosphite products						
Agri-fos, Fungi-Phite, Phostrol Topaz	0	0	0	0	0	0
prohexadione calcium						
Apogee 27.5DF	45	—	—	—	—	—
propiconazole						
Orbit 3.6EC	—	0	0	0	—	0
pyraclostrobin + boscalid						
Pristine 38WDG	0	0	0	0	0	0
pyrimethanil						
Scala	72	2	—	2	72	2
(§)streptomycin						
§Agri-mycin 17WP, Firewall 17WP, Streptrol 17WP, Agricultural streptomycin 17WP	50	—	—	—	30	—

Table 17.1.1 Common names, product names, formulations, and days-to-harvest for pesticides used on tree fruits.

Common Names/ Products Formulations	DAYS TO HARVEST (A)					
	<i>Apples</i>	<i>Apricots</i>	<i>Cherries</i>	<i>Peaches</i>	<i>Pears</i>	<i>Plums</i>
Fungicides and Bactericides(continued)						
(§)sulfur						
§Kumulus DF, § Microthiol Disperss, Wettable sulfur Thiolux Jet	PH	—	0	0	PH	0
tebuconazole						
Elite 45WSP	—	—	0	0	—	—
Tebuzol 45DF	75	0	0	0	75	0
tebuconazole + trifloxystrobin						
Adament 50WG	75	1	1	1	75	1
thiophanate-methyl						
Topsin M WSB, 70WP	(A)	1	1	1	1	1
Topsin 4.5L	(A)	1	1	1	—	1
T-methyl 70W WSB	1	1	1	1	1	1
thiram						
Thiram Granuflo	—	—	—	7	—	—
Triadimefon						
Triadimefon 50DF, Bayleton	45	—	—	—	45	—
trifloxystrobin						
Flint	14	—	—	—	14	—
Gem 500 SC	—	1	1	1	—	1
triflumizole						
*Procure 50WS	14	—	1	—	14	—
ziram						
Ziram 76DF	14	30	14	14	14	—

Key:**BL** Do not apply beyond bloom.**GT** Do not apply beyond green tip.**HIG** Do not apply beyond 1/2-in green.**PB** Prebloom applications only.**PF** Do not apply beyond petal fall.**PH** Postharvest applications allowed.**SS** Do not apply beyond shuck split.**2C** Do not apply after 2d cover spray.**(A)** If more than one value is given, depends on rate, method and/or number of applications; check label.**(B)** Nonbearing trees only.**(C)** Tart cherries only.**(D)** Sweet cherries only

— Not registered for use on crop.

* Restricted-use pesticide; may be purchased and used only by certified applicators, or used by someone under the supervision of a certified applicator.

§ Potentially acceptable in certified organic programs

(§) Not all formulations of the active ingredient are acceptable in certified organic programs.

Table 17.1.2. Common names, product names, formulations, and days-to-harvest for growth regulators.

Common Name/ Product Name	Formulation	EPA Reg. No.	Crop	Preharvest Interval
Amid-Thin W naphthalene-acetamide	8.4 WP	5481-426	Apple, pear	—
Apogee prohexadione calcium	27.5% DF	7969-188	Apple	45 days
Ethrel ethephon	2 lb/gal	264-267	Apple, cherries	7 days
Exilis Plus cytokinin	2.0% liquid	62097-9	Apple	86 days
Fruitone N naphthalene-acetic acid	3.1%	5481-427	Apple, pear	2 days
MaxCel cytokinin	1.9%	73049-407	Apple	86 days
Novagib gibberellin	1.0% liquid	62097-7	Apple	—
Perlan cytokinin+gibberellin	1.8% + 1.8% liquid	62097-6	Apple	—
§ProGibb gibberellic acid	4% liquid	73049-15	cherries	0 days
§ProGibb Plus 2X gibberellic acid	20% SP	73049-16	Sweet cherry	0 days
ProVide gibberellin	2% liquid	73049-3	Apple	—
ProVide gibberellin	10% SG	73049-409	Apple	—
Promalin cytokinin+gibberellin	1.8% + 1.8% liquid	73049-41	Apple, pear, sweet cherry	—
ReTain AVG	15% SP	73049-45	Apple, pear	7 days
RiteSize cytokinin+gibberellin	1.8% + 0.18% liquid	55146-86	Apple	—
RiteWay cytokinin	1.9% liquid	71368-60	Apple	86 days
Tre-Hold RTU naphthalene-acetic acid	1.15%	5481-452	Apple, pear, nectarine	—
Typy cytokinin+gibberellin	1.8% + 1.8% liquid	55146-78	Apple	—

— Preharvest interval information not provided on label.

§ Potentially acceptable in certified organic programs

17.2 EPA numbers and worker protection standard re-entry and personal protective equipment (PPE) guidelines.

Worker Notification: Under most circumstances, worker employers must make sure that workers are notified about areas where pesticide applications are taking place or where restricted-entry intervals are in effect. Some pesticide labels require you to notify workers BOTH orally AND with signs posted at entrances to the treated area. Unless the pesticide labeling requires both types of notification, notify workers EITHER orally OR by the posting of warning signs at entrances to treated areas. You must inform workers which method of notification is being used. For details on notification requirements both for these products and those not represented below, refer to the product label and the Worker Protection Standard, 40 CFR part 170.

Table 17.2.1 Insecticides and acaricides

Product	EPA Reg. No.	Common Name	REI (hrs)	Applicator PPE	Early Entry PPE
*Abba 0.1EC	66222-139	abamectin	12	dfghij	dfghj
Acramite 50WS	400-503	bifenazate	12	ac	cfk
Actara	100-938	thiamethoxam	12	acf	cfk
§Agree WG	70051-47	Bt	4	abcp	bck
*Agri-Mek 0.15EC	100-898	abamectin	12	dfghij	dfghj
Altacor 35WDG	352-730	chlorantraniliprole, rynaxypyr	4	ac	ac
Apollo 4SC	66222-47	clofentezine	12	acf	cfk
*Asana XL 0.66EC	352-515	esfenvalerate	12	acfh	cfhk
Assail 30SG	8033-36-70506	acetamiprid	12	abcj	bck
Avaunt 30WDG	352-597	indoxacarb	12	abc	beg
§Aza-Direct 1.2L	71908-1-10163	azadirachtin	4	abc	bck
Azatin XL 0.27EC	70051-27-59807	azadirachtin	4	acfh	cfhk
*Battalion 0.2EC	264-1007-66330	deltamethrin	12	dfghij	dfghj
*Battalion 1.5 EC	66330-374	deltamethrin	12	dfghij	dfghj
*Baythroid XL 1EC	264-840	beta-cyfluthrin	12	acfh	cfhk
Beleaf 50SG	71512-10-279	flonicamid	12	abc	bck
Belay	59639-150	clothianidin	12	acf	cfk
Belt SC	264-1025	flubendiamide	12	acf	cfk
*Bifenture EC	70506-57	bifenthrin	12	acfh	cfk
§Biobit XL 2.1FC	73049-46	Bt	4	abc	bck
*Brigade 10WS	279-3108	bifenthrin	12	abc	bck
*Brigade 2EC	279-3313	bifenthrin	12	acf	cfk
Calypso 4F	264-806	thiacloprid	12	acf	cfk
§Carpovirusine 0.99SC	66330-55	granulosis virus	4	acfhlo	achf
Centaur WDG	71711-21	buprofezin	12	abc	beg
Checkmate CM-F 14.3S	56336-37	pheromone	4	abcj	bcd
§Checkmate CM-OFM Duel	56336-49	pheromone	0	b	–
Checkmate OFM-F 24.6S	56336-24	pheromone	0	abc	–
Clutch 50 WDG	59639-152	clothianidin	12	abc	bck
§Cyd-X 0.06SC	70051-44	granulosis virus	4	ac	bck
*Danitol 2.4EC	59639-35	fenpropathrin	24	acfh	cfhk
Delegate 25WG	62719-541	spinetoram	4	ac	cfk
§Deliver 18WG	70051-69	Bt	4	abc	bck
*Delta Gold 1.5 EC	264-1011-1381	deltamethrin	12	dfghij	dfghj
§Des-X	67702-22-70051	potassium fatty acids	12	dfghij	
*Diazinon 50W	66222-10	diazinon	96	abc	bcjk
Dimate 4EC	51036-110-9779	dimethoate	48	afghjl	fghjk
Dimethoate 4EC	19713-231	dimethoate	48	fghjk	fghjk
Dimethoate 400	34704-207	dimethoate	10 days	acfil	efgj

Table 17.2.1 Insecticides and acaricides

Product	EPA Reg. No.	Common Name	REI (hrs)	Applicator PPE	Early Entry PPE
§Dipel DF	73049-39	Bt	4	abcp	bck
§Entrust 80WP	62719-282	spinosad	4	ac	bck
Envidor 2SC	264-831	spirodiclofen	12	abc	abc
Esteem 35WP	59639-115	pyriproxyfen	12	ac	bce
*Fanfare 2EC	66222-99	bifenthrin	12	acfh	cfk
§GF-120	62719-498	spinosad	4	ac	bck
*Guthion 50WS	66222-162	azinphos-methyl	14-15 days(E)	efghijm	efghj
Imidan 70WP, 70WS	10163-169	phosmet	72	abcjl	bcjk
Intrepid 2F	62719-442	methoxyfenozide	4	abc	beg
§Isomate-C TT	53575-25	pheromone	0	b	—
§Isomate-CM/OFM TT	53575-30	pheromone	0	b	—
Isomate PTB Dual	53575-43	pheromone	0	b	—
Isomate-M 100	53575-19	pheromone	0	b	—
§Javelin 7.5WDG	70051-66	Bt	4	abcp	bck
JMS Stylet Oil	65564-1	paraffinic oil	12	acf	cfk
Kanemite 15SC	66330-38	acequinocyl	12	acf	cfk
Kelthane 50WSP	62719-414	dicofol	48	bcehijl	bchk
§Kumulus 80DF	51036-352	sulfur	24	abfh	bchk
*Lambda-Cy 1EC	70506-121	lambda-cyhalothrin	24	acfh	acf
*Lannate 90SP	352-342	methomyl	48-96(E)	acfhilq	cfhk
*Lannate LV 2.4L	352-384	methomyl	48-96(E)	acfhilq	cfhk
*Leverage 2.7SE	264-770	imidacloprid/cyfluthrin	12	dfghi	fg hk
*Leverage 360	2645-1104	imidacloprid/ beta-cyfluthrin	12	acf	cfk
*Lorsban 4EC	62719-220	chlorpyrifos	96	dfgijlq	dfgj
Lorsban Advanced	62719-591	chlorpyrifos	96	dfgijlq	dfgj
Lorsban 75WG	62719-301	chlorpyrifos	96	dfgijlq	dfgj
Malathion 57EC	34704-108	malathion	12	acfh	cfhk
Malathion 5EC	19713-217	malathion	12	acf	cfk
Movento 240SC	264-1050	spirotetramat	24	acfh	acfh
§M-Pede 49L	53219-6	insecticidal soap	12	ac	bck
*Mustang Max EC	279-3327	zeta-cypermethrin	12	acfh	cfk
Nexter 75WS	7969-106	pyridaben	12	abchjl	bchjkl
Omni Spray Oil 6E	5905-368	mineral oil	12	acf	cfk
Onager 1EC	10163-277	hexythiazox	12	abc	abc
Portal 0.4EC	71711-19	fenpyroximate	12	acfhj	dfghij
*Pounce 25 WP	279-3051	permethrin	12	abc	bck
*Proaxis 0.5CS	74921-3-34704	gamma-cyhalothrin	24	acfh	cfk
*Proclaim 5SG	100-904	emamectin benzoate	12 or 48 (E)	acef	cfhk
Provado 1.6F	264-763	imidacloprid	12	acf	cfk
Purespray Spray Oil	69526-5	petroleum oil	4	acf	cef
§PyGanic 1.4EC	1021-1771	pyrethrins	12	acf	cfk
Pyrenone	432-1033	pyrethrins/PBO	12	acf	cfk
Rimon 0.83EC	66222-35-400	novaluron	12	acfh	cef h
Savey 50DF	10163-250	hexythiazox	12	abc	abc

Table 17.2.1 Insecticides and acaricides

Product	EPA Reg. No.	Common Name	REI (hrs)	Applicator PPE	Early Entry PPE
Sevin XLR Plus	264-333	carbaryl	12	acfj	cfjk
Sevin 4F	264-349	carbaryl.	12	acfj	cfjk
Sherpa	34704-983	imidacloprid	12	acf	cfk
*Supracide 2EC	10163-236	methidathion	72	acfh	cfhk
*Supracide 25W	10163-244	methidathion	72	abelq	bck
§Surround WP	70060-14	kaolin	4	aclo	ac
*Taiga Z 1CS	100-1112-1381	lambda-cyhalothrin	24	acfh	cfk
*Temprano 0.15EC	67760-71-400	abamectin	12	acfh	dfgh
*Thionex 3EC	66222-63	endosulfan	7 days	efghijm	efghj
*Thionex 50W	66222-62	endosulfan	20 days	bcdhijm	bcjk
Tourismo	71711-33	buprofezin & flubendiamide	12	abcj	cfghj
§Trilogy	70051-2	neem extract	4	acf	cfk
*Vendex 50WP	1812-413	hexakis	48	dfghijq	cfhk
Voliam Flexi	100-1319	thiamethoxam/ chlorantraniliprole	12	acf	cfk
*Voliam Xpress EC	100-1320	lambda-cyhalothrin/ chlorantraniliprole	24	acf	cfk
*Vydate 2L	352-372	oxamyl	48	dfghijm	dfghj
*Warrior II 2.08CS	100-1295	lambda-cyhalothrin	24	acfh	cfk
Zeal 72WS	59639-138	etoxazole	12	acf	acf

Table 17.2.2 Fungicides and bactericides

Product	EPA Reg. No.	Common Name	REI (hrs)	Applicator PPE	Early Entry PPE
Abound 2.08F	100-1098	azoxystrobin	4	acf	cfk
Adament 50WG	264-1052	trifloxystrobin	12	acf	cfk
Ag Streptomycin	66222-121	streptomycin	12	acfo	efgo
§Agri-mycin 17WP	55146-96	streptomycin	12	acf	efg
Agri-fos	71962-1	phosphite	4	abch	bcdh
Aliette WDG	264-516	fosetyl-Al	12	abch	bchk
Allpro Lime Sulfur	769-558	lime sulfur	48	efghijl	efghj
Apogee 27.5%	7969-188	prohexadione calcium	12	acf	cfk
Applause 720	50534-188	chlorothalonil	12	acfh	cfhk
Bac-Master	55146-80-5481	streptomycin	12	abcl	fchk
Bayleton 50DF	264-737-5481	triadimefon	12	acfj	cfk
Botran 75W	10163-189	dichloronitroaniline	12	ac	bck
Bravo Weather Stik	50534-188-100	chlorothalonil	12	acf	cfhk
Bravo Ultrex	50534-201-100	chlorothalonil	12	dfghijl	dfghj
Cabrio EG	7969-187	pyraclostrobin	12	acf	cfk
Captan 50WP	66330-234	captan	24(E)	achilo	cfhk
Captan 80WDG	66222-58-66330	captan	24(E)	acfhio	cfhk
Captec 4L	66330-239	captan	24(E)	acfi	cfhk
Champ Formula-2 4.6F	55146-64	copper hydroxide	24(E)	acfh	cfhk
Chloronil 720	50534-188-100	chlorothalonil	12	acf	cfhk

Table 17.2.2 Fungicides and bactericides

Product	EPA Reg. No.	Common Name	REI (hrs)	Applicator PPE	Early Entry PPE
C-O-C-S WDG	34704-326	copper oxychloride & basic copper sulfate	24	acfh	cfhk
Concorde	72167-24-1812	chlorothalonil	12	acfh	cfhk
Cuprofix Ultra 40 Disperss	70506-201	basic copper sulfate	48	ac	cfk
Dithane Rainshield DF	62719-402	mancozeb	24	acf	cfk
Dithane F-45 Rainshield	62719-396	mancozeb	24	cefhi	cef
Dithane M45	62719-387	mancozeb	24	cefhi	cef
Echo 720	60063-7	chlorothalonil	12(E)	acfhm	cfhk
Echo 90DF	60063-10	chlorothalonil	12(E)	acfhm	bchk
Elevate 50WDG	66330-35	fenhexamid	12	acf	cfk
Elite 45WP	264-749	tebuconazole	12	acfh	acfh
Equus 500ZN	72167-27-66222	chlorothalonil	12	acfh	cfhk
Ferbam Granuflor	45728-7	ferbam	24	acfhjl	cfhjk
Firewall 17WP	80990-4-82695	streptomycin	12	acfq	cfe
Flint	264-777	trifloxystrobin	12	acf	cfk
Fungi-Phite	83472-1	phosphite	4	abch	bchk
GEM 500 SC	264-826	trifloxystrobin	12	acf	cfk
Indar 2F	62719-416	enbuconazole	12	acfj	cfk
Inspire Super MP	100-1262	difenoconazole	12	acfh	cfhk
Iprodione 4L AG	51036-340	iprodione	24	acefjl	cef
§JMS Stylet Oil	65564-1	Paraffinic oil	4	acf	cfk
Kocide 2000	352-656	copper hydroxide	48	acfh	cfhk
Kocide 3000	352-662	copper hydroxide	48	acfh	cfhk
§Kumulus DF	51036-352	sulfur	24	acfh	cfhk
*Manzate 75DF	1812-414-352	mancozeb	24	cefhi	cef
Manzate Flowable	1812-416	mancozeb	24	cefhi	bceh
ManKocide	1812-360	mancozeb + copper hydroxide	24	cefhi	cefh
Mertect 340-F	100-889	thiabendazole	12	ac	cfk
§Microthiol Disperss	70506-187	sulfur	24	acf	cfhk
Miller Lime Sulfur	66196-2-72	lime sulfur	48	efghijl	efghj
§Mycoshield 17WP	55146-97	oxytetracycline HCl	12	acfh	cfhk
§NuCop 50DF	45002-4	copper hydroxide	24	acfh	cfhk
§OxiDate	70299-2	hydrogen dioxide	1	eg	bck
Penbotec 400SC	43813-32-64864	pyrimethanil	psthvst	acf	—
Penncozeb 75DF	4581-370-82695	mancozeb	24	cefhi	cef
Penncozeb 4FL	4581-358-82695	mancozeb	24	cefhi	cef
Phostrol	55146-83	phosphite	4	acfh	cfhk
Polyram 80DF	7969-105-34704	metiram	24	cefhi	cef
Pristine 38WDG	7969-199	pyraclostrobin/boscalid	12	acf	cfk
*Procure 50WS	400-431	triflumazole	12	acf	cfk
Quash	59639-147	metconazole	12	acf	cfk
Quintec	62719-375	quinoxifen	12	acf	cfk
Rally 40WSP	62719-410	myclobutanil	24	acfh	cfhk
Ridomil Gold EC	100-801	mefanoxam	48	acf	cfk
Rovral 50WP	264-453	iprodione	24	efgijl	cfk
Rovral 4 Flowable	264-482	iprodione	24	acf	cfk
Scala	264-788	pyrimethanil	12	acf	ack
Scholar	100-969	fludioxonil	psthvst	acf	—

Table 17.2.2 Fungicides and bactericides

Product	EPA Reg. No.	Common Name	REI (hrs)	Applicator PPE	Early Entry PPE
Scholar SC	100-1242	fludioxonil	psthvst	acf	—
§Serenade ASO	69592-12	<i>Bacillus subtilis</i>	4	abco	abc
Sovran 50WDG	7969-154	kresoxim-methyl	12	acf	cfk
Streptrol	55146-80	streptomycin	4	acfl	cef
Sulforix Lime Sulfur	66196-3-72	lime sulfur	48	efghijl	efghj
Syllit FL	55260-6	dodine	48	acfhij	efghj
T-methyl 70W WSB	66330-301	thiophanate-methyl	48(E)	acf	efgj
Tebuzol 45DF	70506-113	tebuconazole	(E)	acfh	acfh
Thiolux Jet	100-1138	sulfur	24	acfh	efg
Thiophanate Methyl 85WDG	72167-10-66222	thiophanate-methyl	12(E)	acf	cfk
Thiram Granuflo	45728-21	thiram	24	acfj	cfk
Tilt	100-617	propiconazole	12	acfh	cfhk
Topaz	68573-2-1381	phosphite	4	ach	cefh
Topsin M 70WP	73545-11-70506	thiophanate-methyl	48	acefgi	efgi
Topsin M WSB	73545-16-70506	thiophanate-methyl	48	acefgi	efgj
Topsin M 4.5FL	73545-13-70506	thiophanate-methyl	48	acefgi	efgj
Triadimefon 50DF	264-737-45728	triadimefon	12	acfjo	cfjk
§Trilogy	70051-2	neem extract	4	acf	cfk
Vanguard WG	100-828	cyprodinil	12	acf	cfk
Vintage SC	10163-275	fenarimol	24	dfghij	dfghj
Wettable sulfur	5905-289	sulfur	24	acf	cfk
Ziram 76DF	4581-140-82695	ziram	48	abchl	bchk

Table 17.2.3 Growth Regulators

Product	EPA Reg. No.	Common Name	REI (hrs)	Applicator PPE	Early Entry PPE
Amid-Thin W	5481-426	NAD	48	abc	bck
Apogee	7969-188	prohexadione Ca	12	afc	cfk
Ethrel	264-267	ethephon	48	acfh	efghj
Exilis Plus	62097-9-82917	BA	12	acfhi	abch
Fruitone N	5481-427	NAA	48	acf	bck
Maxcel	73049-407	BA	12	acf	cfk
Novagib	62097-7-82917	GA ₄₊₇	4	acfhij	abch
Perlan	62097-6-82917	GA ₄₊₇ + BA	4	acfhi	abch
§Pro-Gibb 4%	73049-15	GA ₃	12	acfh	cfhk
§Pro-Gibb Plus 2X	73049-16	GA ₃	4	abc	bck
Pro-Vide PGR	73049-3	GA ₄₊₇	12	acfh	cfhk
Pro-Vide 10 SG	73049-409	GA ₄₊₇	12	acfh	cfhk
Promalin	73049-41	GA ₄₊₇ + BA	4	abch	bck
ReTain	73049-45	AVG	12	abc	bck
RiteSize	55146-86	BA + GA ₄₊₇	12	ach	bchk
RiteWay	71368-60	BA	12	acfh	cfhk
Tre-Hold RTU	5481-452	NAA	12	acfh	cfhk
Typrus	55146-85	GA ₄₊₇	24	acfh	cdfh
Typy	55146-78	BA + GA ₄₊₇	24	dfghim	abch

Key:

a	.....	Long-sleeved shirt & long pants
b	.....	Waterproof gloves
c	.....	Shoes plus socks
d	.....	Coveralls over short-sleeved shirt & short pants
e	.....	Coveralls over long-sleeved shirt & long pants
f	.....	Chemical-resistant gloves; refer to label for specifics
g	.....	Chemical-resistant footwear & socks
h	.....	Protective eyewear
i	.....	Chemical-resistant apron when cleaning equipment, mixing or loading
j	.....	Chemical-resistant headgear for overhead exposure
k	.....	Coveralls
l	.....	Dust/mist filtering respirator (MSHA/NIOSH approval no. prefix TC-21C)
m	.....	Respirator with either an organic vapor-removing cartridge with a pre-filter approved for pesticides (MSHA/NIOSH approval no. prefix TC-3) or a canister for pesticides (MSHA/NIOSH approval no. prefix TC-14G)

n	.....	Face shield for mixing and loading
o	.....	Dust/mist filtering respirator (NIOSH approved) with any N, R, P or HE filter
p	.....	Dust/mist filtering respirator meeting NIOSH standards of at least N-95, R-95, and P-95
q	.....	NIOSH approved respirator with any R, P, or HE filter
PPE	.....	Personal protective equipment
REI	.....	Re-entry interval
(E)	.....	Refer to label for details of restricted entry interval
psthvst	.....	Post-harvest use only
§	.....	Potentially acceptable in certified organic programs
*	.....	Restricted-use pesticide; may be purchased and used only by certified applicators, or used by someone under the supervision of a certified applicator.

17.3 Spray Mixture Compatibility**Notes**

This information is offered only as a general guide, and does not apply to pesticidal efficacy of mixtures. Read the label for specific crops or situations. Compatibilities indicated may be changed by certain adjuvants, different formulations, combinations of more than two materials, and environmental factors such as temperature and humidity.

- When potential compatibility is indicated, minimum agitation should be provided in all cases.
- Designations apply to at least one formulation of specified products. In cases where compatibility differs among formulations, the most conservative designation has been given. Defer to respective labels in all cases.
- Unless otherwise noted on the label, use soon after mixing, preferably in systems with continuous agitation.
- Physical compatibility: Although there may be no chemical incompatibility between the active ingredients of two given pesticides, some formulations of these products may not be physically compatible. This is particularly true when mixing at high concentrations and when mixing wettable powders with emulsifiable concentrates. It is recommended that a small batch of a proposed mixture be prepared before making tank combinations, to check for unacceptable physical reactions.

Directions

- Each product is assigned its own number, which appears to the left of the product name along the left-hand side of the chart.
- The product numbers (but not their names) are also listed along the top of the chart.
- To find the symbol representing our best information about compatibility of two products, find one product's number along the side and the other along the top, and

trace the perpendicular lines to intersect in the table body.

- The compatibility values, which are highlighted in alternate rows and columns for ease in counting, are defined in the Key at the bottom. Also note the following footnotes:
 - §Bt products include Agree, Biobit, Deliver, Dipel, and Javelin, among others.
 - (§)Fixed copper products include C-O-C-S, Kocide, Champ, Cuprofix Disperss, and Tenn-Cop, among others.
- The “Mancozeb/+rams” category includes Dithane, Manzate, Penncozeb, as well as Thiram and Ziram.
- The “Pyrethroids” category refers primarily to Ambush and Pounce (permethrin).
- “Sterol Inhibitors” includes Rubigan, Nova, Indar, Orbit, Procure, and Elite.

Suggested Mixing Sequence

Always mix different spray materials in the following order, starting with:

- water soluble bags (WS)
- water dispersible granules and dry flowables (WDG, DF)
- wettable powders (WP)
- liquid flowables (L, F, FC)
- sprayable concentrates (S, SC, LC)
- emulsifiable concentrates (EC)
- surfactants, oils, and adjuvants Do not add oils, surfactants, or emulsifiable concentrates prior to dry formulations, or lumping may occur.

Table 17.3.1. Spray Mixture Compatibility (Courtesy of The Pennsylvania State University)

	PRODUCT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	Acramite	-	1	1	1	1	1	1	1	1	4	1	1	1	4	1	1	1	1	1	1	4	4	1
2	Actara	1	-	1	1	1	1	1	1	1	4	1	1	1	4	1	1	1	1	1	1	4	4	1
3	Apollo	1	1	-	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	4	4	1
4	*Asana	1	1	1	-	1	1	1	1	1	4	1	1	1	4	1	1	1	1	1	1	4	4	1
5	Assail	1	1	1	1	-	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	4	4	1
6	*AgriMek	1	1	1	1	1	-	1	1	1	4	1	1	1	4	1	1	1	1	1	1	4	4	1
7	Avaunt	1	1	1	1	1	1	-	1	1	4	1	1	1	4	1	1	1	1	1	1	4	4	1
8	*azinphosmethyl	1	1	1	1	1	1	1	-	1	4	1	1	1	4	1	1	1	1	1	1	1	1	1
9	§Bt	1	1	1	1	1	1	1	1	-	3	1	1	1	1	1	1	3	1	1	1	3	1	1
10	Bordeaux mixture	4	4	4	4	4	4	4	4	3	-	3	1	3	1	1	4	3	3	3	4	2	1	4
11	captan	1	1	1	1	1	1	1	1	1	3	-	1	1	1	1	1	1	1	5	1	1	4	1
12	carbaryl	1	1	1	1	1	1	1	1	1	3	1	-	1	1	1	1	1	1	4	1	1	1	1
13	Carzol	1	1	1	1	1	1	1	1	1	3	1	1	-	1	1	1	1	4	1	1	1	4	1
14	chlorothalonil	4	4	1	4	1	4	4	4	1	1	1	1	-	1	1	1	1	1	4	4	5	4	1
15	chlorpyrifos	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	1	1	1	1	1	1	1	1
16	*Danitol	1	1	1	1	1	1	1	1	1	4	1	1	1	4	1	-	1	1	1	1	4	4	1
17	*diazinon	1	1	1	1	1	1	1	1	3	3	1	1	1	4	1	1	-	1	1	1	1	2	1
18	dimethoate	1	1	1	1	1	1	1	1	1	3	1	1	4	1	1	1	1	-	1	1	2	4	1
19	*endosulfan	1	1	1	1	1	1	1	1	1	3	5	4	1	4	1	1	1	1	-	1	1	1	1
20	Esteem	1	1	1	1	1	1	1	1	1	4	1	1	1	4	1	1	1	1	1	-	4	4	1
21	ferbam	4	4	4	4	4	4	4	1	1	2	1	1	1	5	1	4	1	2	1	4	-	1	1
22	(§)fixed copper	4	4	4	4	4	4	4	1	1	1	4	1	4	4	1	4	2	4	1	4	1	-	4
23	Imidan	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	4	-
24	Intrepid	1	1	1	1	1	1	1	1	1	4	1	1	1	4	1	1	1	4	1	1	4	4	1
25	Kelthane	1	1	1	1	1	1	1	1	1	4	1	1	1	4	1	1	1	4	1	1	4	4	1
26	*Lannate	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	4	1	4	1	1
27	lime	4	4	4	4	4	4	4	3	1	1	3	3	3	1	1	4	4	3	3	4	2	1	3
28	malathion	1	1	4	1	4	1	1	1	1	3	5	1	4	1	1	1	1	1	1	1	1	1	1
29	mancozeb/+rams	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1
30	Nexter	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1
31	(§)oil	1	1	1	1	1	1	1	5	4	1	3	4	1	1	1	1	1	4	4	1	1	4	6
32	Provado	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1
33	*pyrethroids	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	4	4	1
34	Rovral	4	4	4	4	4	4	1	1	1	1	1	1	1	4	1	1	1	1	1	4	1	1	1
35	Savey	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	4	4	1
36	Spintor	1	1	1	1	1	1	1	1	1	4	1	1	1	4	1	1	1	1	1	1	4	4	1
37	sterol inhibitors	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
38	(§)sulfur	1	1	1	1	1	1	5	1	3	1	6	1	1	1	1	1	1	1	1	1	1	1	1
39	*Supracide	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4
40	§Surround	1	1	1	1	1	1	1	1	1	3	1	1	1	4	1	1	1	1	1	1	4	4	1
41	Syllit	1	1	1	1	1	1	1	5	1	3	1	1	1	4	4	1	1	1	5	1	1	4	1
42	Topsin	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	3	1
43	*Vendex	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	4	1	1	1	4	1
44	*Vydate	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
45	*Warrior	1	1	1	1	1	1	1	1	1	4	1	1	1	4	1	1	1	1	1	1	1	1	4

KEY:

1 = Potentially compatible, if used as directed

2 = Decomposes on standing, residual action reduced

3 = Not compatible or causes general injury

4 = CAUTION: Compatibility not clear, or questionable or not known

5 = Use wettable powder forms

6 = May cause injury; refer to comments in "Fruit Crop Protectants" or crop's "General Pest Management Considerations"

Table 17.3.1. Spray Mixture Compatibility (continued) (Courtesy of The Pennsylvania State University)

	PRODUCT	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
1	Acramite	1	1	1	4	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1
2	Actara	1	1	1	4	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1
3	Apollo	1	1	1	4	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1
4	*Asana	1	1	1	4	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1
5	Assail	1	1	1	4	4	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1
6	*AgriMek	1	1	1	4	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1
7	Avaunt	1	1	1	4	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1
8	*azinphosmethyl	1	1	1	3	1	1	1	5	1	1	1	1	1	1	5	1	1	5	1	1	1	1
9	§Bt	1	b	1	1	1	1	1	4	1	1	1	1	1	1	3	1	1	1	1	1	1	4
10	Bordeaux mixture	4	1	3	1	3	1	1	1	3	3	1	4	4	1	1	1	3	3	3	3	1	1
11	captan	1	4	1	3	5	1	1	3	1	1	1	1	1	1	6	1	1	1	1	1	1	1
12	carbaryl	1	1	1	3	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	Carzol	1	1	1	3	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14	chlorothalonil	4	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	4	4	1	1	1	4
15	chlorpyrifos	1	4	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	4	1	1	1	1
16	*Danitol	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	*diazinon	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	dimethoate	4	4	1	3	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	4	1	1
19	*endosulfan	1	1	4	3	1	1	4	4	1	1	1	1	1	1	1	1	1	5	1	1	1	1
20	Esteem	1	1	1	4	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1
21	ferbam	4	1	4	2	1	1	1	1	1	4	1	4	4	1	1	1	4	1	1	1	1	4
22	(§)fixed copper	4	4	1	1	1	1	1	1	4	4	1	4	4	1	1	1	4	4	3	4	1	4
23	Imidan	1	1	1	3	1	1	1	6	1	1	1	1	1	1	1	4	1	1	1	1	1	1
24	Intrepid	-	1	1	4	1	1	1	4	1	1	1	1	1	1	4	1	1	1	1	1	1	1
25	Kelthane	1	-	1	2	4	1	1	4	1	1	4	1	1	1	4	4	1	1	1	1	1	1
26	*Lannate	1	1	-	3	4	4	1	4	1	4	1	1	1	1	4	1	1	4	1	1	1	1
27	lime	4	2	3	-	3	1	1	1	3	3	1	4	4	1	1	1	4	3	3	4	1	4
28	malathion	1	4	4	3	-	5	1	1	1	1	1	4	1	1	1	1	1	1	6	1	1	1
29	mancozeb/+rams	1	1	4	1	5	-	1	4	1	4	1	1	1	1	1	1	1	1	1	1	1	1
30	Nexter	1	1	1	1	1	1	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
31	(§)oil	4	4	4	1	1	4	1	-	4	1	1	1	4	1	3	1	1	1	1	1	1	1
32	Provado	1	1	1	3	1	1	1	4	-	1	1	1	1	1	1	1	1	1	1	1	1	1
33	*pyrethroids	1	1	4	3	1	4	1	1	1	-	1	1	1	1	4	1	1	4	1	1	4	1
34	Rovral	1	4	1	1	1	1	1	1	1	1	-	4	4	1	1	1	4	1	1	1	4	4
35	Savey	1	1	1	4	4	1	1	1	1	1	4	-	1	1	1	1	1	1	1	1	1	1
36	Spintor	1	1	1	4	1	1	1	4	1	1	4	1	-	1	4	1	1	1	1	1	1	1
37	sterol inhibitors	1	1	1	1	1	1	1	1	1	1	1	1	1	-	1	1	3	1	1	1	1	1
38	(§)sulfur	4	4	4	1	1	1	1	3	1	4	1	1	4	1	-	1	1	6	1	1	1	1
39	*Supracide	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	-	4	1	1	1	1	1
40	§Surround	1	1	1	4	1	1	1	1	1	1	4	1	1	3	1	4	-	1	1	1	1	1
41	Syllit	1	1	4	3	1	1	1	1	1	4	1	1	1	1	6	1	1	-	1	1	1	1
42	Topsin	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	1	1	1
43	*Vendex	1	1	1	4	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	4	1
44	*Vydate	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	1	1	1	1	4	-	1
45	*Warrior	4	1	1	4	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	-

KEY:

1 = Potentially compatible, if used as directed

2 = Decomposes on standing, residual action reduced

3 = Not compatible or causes general injury

4 = CAUTION: Compatibility not clear, or questionable or not known

5 = Use wettable powder forms

6 = May cause injury; refer to comments in "Fruit Crop Protectants" or crop's "General Pest Management Considerations"

17.4. Tree Fruit Reference Materials.

Univ. Massachusetts Fact Sheets Online at: <http://www.umass.edu/fruitadvisor/factsheets/factsheets.html>

F-101R	Controlling Growth of Apple Trees
F-114R	Limb Positioning
F-116R	Maintaining a Balance Between the Top and Bottom of Apple Trees
F-118R	Thinning Apples Chemically
F-119R	Foliar Calcium Sprays for Apples
F-124	Nutrient Recommendations for Apples
F-126	Prebloom Nutrient Application for Apple Trees
F-127R	Apogee – A New Growth Retardant for Apples
F-128	Expansion of the Apple Harvest Season
F-129A	Late-season “Rescue” Thinning with Ethephon
F-130	Apple Tree Pruning and Training (English & Spanish)
F-131	Enhancing Return Bloom on Apple with Plant Growth Regulators
F-133	An Annual Fireblight Management Program
	Predicting Delicious Storage Scald
F-200	Peach Leaf Curl
	Block-specific Spray Calibration Worksheet
	Dogwood Borer in Dwarf Apples

Univ. Maine Publications

Orchard Fruit Pest Management - applicator training manual	http://pmo.umext.maine.edu/apple/OrchardFruitPAT.pdf
Planting and Early Care of Fruit Trees	http://www.umext.maine.edu/onlinepubs/htmpubs/2411.htm
Renovating Old Apple Trees	http://www.umext.maine.edu/onlinepubs/htmpubs/2409.htm

Univ. Vermont Fact Sheets

Online at: orchard.uvm.edu/

IPM 'Quick' Summary for Monitoring Apple Arthropod Pests
IPM Checklist for Vermont
Key Arthropods and Diseases Affecting Apples: A Synopsis
Apple Orchard Information for Beginners

Newsletters & Periodicals

Healthy Fruit Newsletter (UMass)	http://www.umass.edu/fruitadvisor/healthy_fruit/
Fruit Notes (UMass)	http://www.umass.edu/fruitadvisor/fruitnotes/FruitNotes.htm
Apple Pest Report Newsletter (UMaine)	http://pmo.umext.maine.edu/apple/AppPestReport.html
Apple IPM News (UVM)	http://orchard.uvm.edu/uvmapple/pest/

Websites

- Pesticide labels and MSDS sheets for most registered pesticides: <http://www.cdms.net/manuf/manuf.asp> [NOTE: The labels at this site may or may not contain state-specific restrictions.]
- Up-to-date listing of maximum residue levels for countries that import U.S. fruits: <http://www.mrlidatabase.com>
- Rhode Island Apple IPM: <http://www.uri.edu/research/ipm>
- Rhode Island Fruit Growers website: <http://www.rifruitgrowers.org>
- Rhode Island product registration: <http://state.ceris.purdue.edu/htm/ri.htm>
- UMaine Apple IPM: <http://pmo.umext.maine.edu/apple/> Links to fact sheets, apple pest report newsletter, and updated weather-driven pest phenology models of use to commercial and hobbyist apple growers in Maine.
- Maine State Pomological Society <http://www.maineapples.org/> Apple lore, orchard locations in Maine.
- PRONewEngland: <http://pronewengland.org/> Links to university, government, private sector pest management contacts, state pesticide registrations, fact sheets, and other online pest management information for the six New England states.
- UMass Fruit Advisor: <http://www.umass.edu/fruitadvisor/> Provides resources for commercial tree- and small-fruit growers, including access to archives of *Healthy Fruit*, *Berry Notes*, and *Fruit Notes*, various fact sheets, videos, and other useful information for fruit growers.
- UConn IPM: <http://www.hort.uconn.edu/ipm> Provides timely information on fruit pests and other fruit topics including meeting announcements and the online version of Crop Talk, a newsletter for commercial fruit and vegetable growers.
- Univ. Vermont's OrganicA: <http://www.uvm.edu/organica/> A resource for organic apple production in New England.
- Univ. Vermont's Apple Program: <http://orchard.uvm.edu/> A website for commercial apple growers in Vermont.

Cornell Tree Fruit IPM Fact SheetsOnline at: www.nysipm.cornell.edu/factsheets/treefruit/

A series of fact sheets developed for insect and disease pests of tree-fruit crops. These outline the biology, monitoring, and management of various pests and include color photographs to aid in identification.

Insect IPM Fact Sheets

102GFSTF-11	Pear Psylla. 1978.
102GFSTF-12	Codling Moth. 1996.
102GFSTF-13	Plum Curculio. 1980.
102GFSTF-14	Green Fruitworm. 1980.
102GFSTF-15	Obliquebanded Leafroller. 1980.
102GFSTF-16	Peachtree Borer. 1980.
102GFSTF-18	Apple Maggot. 1991.
102GFSTF-19	Spotted Tentiform Leafminer. 1980.
102GFSTF-110	European Red Mite. 1980.
102GFSTF-111	Rosy Apple Aphid. 1980.
102GFSTF-112	San Jose Scale. 1980.
102GFSTF-113	White Apple Leafhopper. 1980.
102GFSTF-114	Dogwood Borer. 1985.
102GFSTF-115	Cherry Fruit Fly & Black Cherry Fruit Fly. 1988.
102GFSTF-116	Woolly Apple Aphid. 1988.
102GFSTF-117	Oriental Fruit Moth. 1988.
102GFSTF-118	Beneficial Insects. 1989.
102GFSTF-119	Redbanded Leafroller. 1989.
102GFSTF-120	European Apple Sawfly. 1991.
102GFSTF-121	Tarnished Plant Bug. 1991.
102GFSTF-122	Comstock Mealybug. 1991.
102GFSTF-123	Predatory Mites. 1995.
102GFSTF-124	American Plum Borer. 1997.
102GFSTF-125	Phytophagous Mirid Bugs. 1998.
102GFSTF-126	Apple-Boring Beetles. 1999.

Disease IPM Fact Sheets

102GFSTF-D3	Fire Blight. 1994.
102GFSTF-D4	Powdery Mildew of Apple. 2004.
102GFSTF-D5	Cedar Apple Rust. 1981.
102GFSTF-D6	Black Knot of Plum. 1992.
102GFSTF-D7	Phytophthora Root and Crown Rots. 1992.
102GFSTF-D8	Cherry Leaf Spot. 1993.
102GFSTF-D9	Apple Scab. 1993.
102GFSTF-D10	Brown Rot of Stone Fruits. 1993.
102GFSTF-D11	Sooty Blotch and Flyspeck. 1994.
102GFSTF-D12	Perennial Canker. 1995.

Mammal IPM Fact Sheets

102GFSTF-M1	Meadow Vole and Pine Vole. 1988.
-------------	----------------------------------

Cornell Extension Bulletins

IB 219	Orchard Nutrition Management. 1991. hdl.handle.net/1813/3305
IB 221	Predicting Harvest Date for Apples. 1992. hdl.handle.net/1813/3299
IPM207	Apple IPM. 1999. nysipm.cornell.edu/publications/apple_man

Cornell's Scaffolds NewsletterOnline at: <http://www.nysaes.cornell.edu/ent/scaffolds/>**Cornell Food and Life Sciences Bulletins**Online at: <http://www.nysaes.cornell.edu/pubs/fls/>

FLS 50	Green Fruitworms. 1974.
FLS 58	Growth Stages in Fruit Trees - From Dormant to Fruit Set. 1976.
FLS 92	Biology and Control of Cytospora Fungi in Peach Plantings. 1982.
FLS 95	Blister Spot of Apple. 1982.
FLS 108	Diagnostic Keys for Diseases of Apple, Peach and Cherry. 1984.
FLS 116	Chemical Thinning of Apples. 1986.
FLS 117	Peach and Nectarine Varieties in New York State. 1986.
FLS 118	Preventing Decomposition of Agricultural Chemicals by Alkaline Hydrolysis in the Spray Tank. 1986.
FLS 123	Basing European Red Mite Control Decisions on a Census of Mites Can Save Control Costs. 1988.
FLS 124	Insects Associated with Apple in the Mid-Atlantic States. 1988.
FLS 127	Sweet and Tart Cherry Varieties: Descriptions and Cultural Recommendations. 1989.
FLS 128	Effects of Ground Cover Manipulations on Pest and Predator Mite Populations on Apple in Eastern NY. 1989.
FLS 142	Fruit Pest Events and Phenological Development According to Accumulated Heat Units. 1993.
FLS 143	Sampling Second Generation Spotted Tentiform Leafminer. 1993.
FLS 158	New York Integrated Fruit Production Protocol for Apples. 2006.

NRAES Publications

Available from NRAES, Natural Resource, Agriculture and Engineering Service, Cooperative Extension, P.O. Box 4557, Ithaca, NY 14852-4557, Tel: 607-255-7654 FAX: 607-254-8770

NRAES-37	Orchard Spraying: Getting Results. 1993.
NRAES-38	Hydraulic nozzles for boom sprayers. 1994.
NRAES-78	On-Farm Agrichemical Handling Facilities. 1995.
NRAES-169	Tree Fruit Field Guide to Insect, Mite and Disease Pests and Natural Enemies of Eastern North Amer. 2006.

17.5 Diagnostic and Analytical Services

To submit samples for insect or disease diagnosis or plant identification, contact:

UConn Home & Garden Education Center
Ratcliffe Hicks Building, Room 4
1380 Storrs Rd., Unit 4115
Storrs, CT 06269-4115
(860)486-6271 or toll-free 1-877-486-6271
www.ladybug.uconn.edu

Plant Disease Information Office
The Connecticut Agricultural Experiment Station
123 Huntington Street, P.O. Box 1106
New Haven, CT 06504
(203) 974-8601
www.ct.gov/caes/pdio

UMaine Coop. Ext. Insect & Plant Disease Diagnostic Lab
Pest Management Office
491 College Avenue
Orono, ME 04473
Insect Inquiries: 207-581-2963
Disease Inquiries: 207-581-3883
<http://umaine.edu/ipm/ipddl/>

UMass Extension Plant Diagnostics Laboratory
UMass Plant Diagnostic Lab
101 University Drive, Suite A7
Amherst, MA 01002
413-545-3209
<http://www.umass.edu/agland/diagnostics/>

UNH Arthropod Identification Center
G28 Spaulding Hall
University of New Hampshire
38 College Road
Durham, NH 03824
603-862-3200
<http://extension.unh.edu/Agric/AGPDTS/ArthroID.htm>

UNH Plant Diagnostic Laboratory
G37 Spaulding Hall
University of New Hampshire
38 College Road
Durham, NH 03824
603-862-3841
<http://extension.unh.edu/Agric/AGPDTS/PlantH.htm>

URI Plant Clinic
3 East Alumni Ave.
Cooperative Extension Education Center
Kingston, RI 02881
401-874-2900
<http://www.uri.edu/ce/ceec/plantclinic.html>

To submit soil or leaf tissue nutrient analysis samples, contact:

Connecticut Agricultural Experiment Station
Slate Laboratory
P.O. Box 1106
New Haven, CT 06504
203-974-8521
<http://www.caes.state.ct.us/Soiloffice/soiltesting.htm>

UConn Soil Nutrient Analysis Laboratory
6 Sherman Place, U-102
University of Connecticut
Storrs, CT 06269-5102
860-486-4274
<http://www.soiltest.uconn.edu>

UMaine Analytical Laboratory
Maine Soil Testing Service
5722 Deering Hall
University of Maine
Orono, ME 04469-5722
207-581-3591 or 207-581-2945
<http://anlab.umesci.maine.edu/>

UMass Soil & Tissue Testing Laboratory
West Experiment Station
682 North Pleasant Street
University of Massachusetts
Amherst, MA 01003
413-545-2311
<http://www.umass.edu/soiltest/>

UNH Cooperative Extension Soil Testing Program
G28A Spaulding Life Science Center
38 College Road
University of New Hampshire
Durham, NH 03824
603-862-3200
<http://extension.unh.edu/Agric/AGPDTS/SoilTest.htm>

UVM Agricultural & Environmental Testing Laboratory
209 Hills Building
University of Vermont
Burlington, VT 05405
802-656-3030
http://www.uvm.edu/pss/ag_testing/

17.6 Extension Faculty and Staff

Name/Address	Area of Specialization	Phone/Email
CONNECTICUT		
Lorraine Los University of Connecticut Department of Plant Science 1390 Storrs Rd., Unit 4163 Storrs, CT 06269-4163	Fruit IPM	860-486-6449 Lorraine.Los@uconn.edu
Candace Bartholomew University of Connecticut 1800 Asylum Ave. West Hartford, CT 06117	Pesticide Applicator Training	860-570-9067 Candace.Bartholomew@uconn.edu
MAINE		
John Forbes USDA Animal Damage Control Augusta, ME	Vertebrate pest management	207-622-8263 or toll-free at 1-866-487-3297 john.forbes@aphis.usda.gov
Beth Calder University of Maine CE 5735 Hitchner Hall Orono, ME 04473	Fruit processing, processing regulation	207-581-2791 beth.ccalder@maine.edu
James Dill Pest Management Office 491 College Ave. Orono, ME 04473	Pesticide applicator safety education	207-581-3879 james.dill@maine.edu
Steve Giguere Maine Dept. of Agriculture	Fruit processing, processing regulation	207-287-7517 Steve.Giguere@maine.gov
John Jemison 495 College Ave. Orono, ME 04473	Water management, irrigation	207-581-3241 jemison@maine.edu
Glen Koehler Pest Management Office 491 College Ave. Orono, ME 04473	Tree-fruit pest management	207-581-3882 glen.koehler@maine.edu
James McConnon Room 104C 5741 Libby Hall Orono, ME 04469-5741	Farm business management	207-581-3165 mccnonn@maine.edu
Renae Moran Highmoor Farm PO Box 179 Monmouth, ME 04259	Tree-fruit horticulture and production	207-933-2100 rmoran@maine.edu
MASSACHUSETTS		
Wesley Autio Dept. Plant, Soil, & Insect Sci. Bowditch Hall, UMass Amherst, MA 01003	Tree-fruit culture and management Rootstocks	413-545-2963 autio@pssci.umass.edu
Jon Clements Dept. Plant, Soil, & Insect Sci. UMass Cold Spring Orchard 393 Sabin Street Belchertown, MA 01007	Tree-fruit culture and management	413-478-7219 clements@umext.umass.edu

17.6 Extension Faculty and Staff

Name/Address	Area of Specialization	Phone/Email
MASSACHUSETTS (<i>continued</i>)		
Daniel Cooley Dept. Plant, Soil, & Insect Sci. Fernald Hall, UMass Amherst, MA 01003	Tree-fruit IPM Disease management	413-577-3803 dcooley@microbio.umass.edu
Duane Greene Dept. Plant, Soil, & Insect Sci. Bowditch Hall, UMass Amherst, MA 01003	Tree-fruit culture and management Plant growth regulators, apple varieties	413-545-5219 dgreene@pssci.umass.edu
Natalia Clifton Dept. Plant, Soil, & Insect Sci. Agric. Engineering Bldg., UMass Amherst, MA 01003	Pesticide Education	413-545-1044 nclifton@psis.umass.edu
NEW HAMPSHIRE		
Alan Eaton Spaulding Hall, UNH 38 College Road Durham, NH 03824	Entomology	603-862-1734 alan.eaton@unh.edu
George Hamilton Hillsborough County Coop. Ext. 329 Mast Road Goffstown, NH 03045	Tree-fruit culture and management	603-641-6060 george.hamilton@unh.edu
Amy Ouellette Belknap County Coop. Ext. 36 County Drive Laconia, NH 03246	Tree-fruit culture and management	603-527-5475 amy.ouellette@unh.edu
Cheryl Smith Spaulding Hall, UNH 38 College Road Durham, NH 03824	Plant Health	603-862-3841 cheryl.smith@unh.edu
RHODE ISLAND		
Kristen Dame Castrataro 3 East Alumni Ave. University of Rhode Island Kingston, RI	Agricultural Agent	401-874-2967 kcas@uri.edu
Heather Faubert Dept. of Plant Sciences University of Rhode Island Kingston, RI	Tree fruit IPM	401-874-2967 hhf@uri.edu
Margaret Siligato Dept. of Plant Sciences University of Rhode Island Kingston, RI	Pesticide Applicator Training	401-874-5997 siligato@uri.edu
VERMONT		
Lorraine Berkett Dept. of Plant and Soil Science University of Vermont Burlington, VT	Apple IPM	802-656-0972 Lorraine.Berkett@uvm.edu
Ann Hazelrigg Dept. of Plant and Soil Science University of Vermont Burlington, VT	Pesticide Applicator Training	802-656-0493 Ann.Hazelrigg@uvm.edu

17.7 Abbreviations and Symbols Used in this Publication

Formulations

a.e.	acid equivalent
A	acre
AI	active ingredient
AS	aqueous solution
CS	capsule suspension
D	dust
DF	dry flowable
DG	dispersible granule
E, EW	emulsion, emulsifiable
EC	emulsifiable concentrate
E.U.P.	Experimental Use Permit
F, FL	flowable
FC	flowable concentrate
FM	flowable microencapsulated
G	granular
L	liquid
LC	liquid concentrate
P	pellets
PHI	preharvest interval
S	sprayable
SC	suspension concentrate
SG	soluble granule
SP	soluble powder
SS	soluble salt
ULV	ultralow volume
W	wettable
WBC	water-based concentrate
WDG, WG	water dispersible granules
WS	water soluble packets
WP	wettable powder

Product-Specific Symbols

*	restricted-use pesticide; may be purchased and used only by certified applicators, or used by someone under the supervision of a certified applicator.
#	2(ee) recommendation based on an efficacy statement
##	2(ee) recommendation based on quantitative efficacy data
§	potentially acceptable in certified organic programs
(§)	not all formulations of the active ingredient are acceptable in certified organic programs

PHI (Pre-Harvest Interval) and REI (Restricted Entry Interval) Abbreviations

BL	Do not apply beyond bloom
DD	Delayed dormant application
GT	Do not apply beyond green tip
HIG	Do not apply beyond 1/2-in. green
PB	Prebloom applications only
PF	Do not apply beyond petal fall
PH	Postharvest applications allowed
SS	Do not apply beyond shuck split
2C	Do not apply after 2d cover spray
(A)	Depends on rate, method or number of applications; refer to label for more details
(B)	Nonbearing trees only
(C)	Tart cherries only
(D)	Restricted entry interval: 96 hr (peaches), 72 hr (apples), 48 hr (pears)
(E)	Refer to label for details of restricted entry interval
(F)	Sweet cherries only
(G)	Refer to label for details on timing of application

Codes for personal protective gear shown under table 17.2 for REI requirements.