

7 Insect and Mite Management

Table 7.1.1. Activity spectrum of pome fruit insecticides and acaricides

Insecticide	IRAC‡	Ratings for the Control of													Relative Toxicity to Beneficials				
		AM	Aph	Int	GFW	LH	OBLR	PC	PPs	RAA	RBLR	SJS	STLM	TPB	Bees	Af	Tp	Sp	Aa
Actara (thiamethoxam)	4A	—	1	1	—	3	0	3	3	3	0	0	2	2	M	L[d]	L[d]	L	L
*Agri-Mek, *Abacus, *Abamectin, *Abba, *Epi-Mek, *Temprano (abamectin)	6	—	—	—	—	3	—	—	3	—	—	—	3	—	L	M	M[d]	M	L
Altacor (chlorantraniliprole)	28	1	—	3	3	1	3	1	—	—	3	—	2	—	L	L	L	L	L
*Ambush, *Pounce (permethrin)	3	—	2	—	3	—	2-3	3	2	2	3	1	3	3	H	H	H	H	L
*Asana XL (esfenvalerate)	3	3	2	3	3	3	2-3	3	2	2	3	1	3	3	H	H	H	H	M
Assail (acetamiprid)	4A	3	3	3	—	3	0	2	2	3	0	2	3	2	L	M	L	M	M
Avaunt (indoxacarb)	22	2	1	2	—	3	0	3	—	0	—	0	2	2	M	L[d]	L[d]	L	L
§Aza-Direct, §Neemix (azadirachtin)	18B	—	2	2	—	2	—	0	—	2	—	—	3	—	M	L[d]	L	L	L
§B.t, (§Biobit, §Dipel, §Javelin, MVP)	11B2	0	0	2	3	0	3	0	0	0	3	—	0	0	L	L[d]	L[d]	L	L
Beleaf (flonicamid)	9C	—	3	—	—	—	—	—	—	—	—	—	—	3	L	—	—	—	—
*Baythroid (cyfluthrin)	3	3	2	3	3	3	2-3	3	—	—	3	—	3	3	H	H	H	H	H
Belt (flubdiazide)	28	—	—	3	3	—	3	—	—	—	3	—	—	—	L	L	L	L	L
*Calypso (thiacloprid)	4A	3	3	3	—	3	1	3	3	1	1	2	3	1	L	L	L	M	L
*Danitol (fenpropathrin)	3	3	2	3	3	3	2-3	3	2	2	3	1	3	3	H	H	H	H	H
Delegate (spinetoram)	5	2	0	3	3	—	3	2	3	—	3	—	3	—	L	M	M	L	L
*diazinon	1B	—	1	2	2	1	0	2	0	3	0	2	1	1	H	M	M	M	H
dimethoate – pears only	1B	—	2	3	2	3	0	2	0	2	0	2	1	2	H	H	H	M	H
Esteem (pyriproxyfen)	7C	0	0	2	0	0	0	0	3	3	0	3	2	0	L	L	L	M	L
*Guthion (azinphos- methyl)	1B	3	1	3	1	1	1	3	0	1	3	2	1	1	H	L	L	L	H
*Imidan (phosmet)	1B	3	1	3	1	1	1	3	0	1	3	2	1	1	H	L	L	L	M
*Intrepid (methoxyfenozide)	18A	0	0	2	—	0	3	0	—	0	3	0	2	0	L	L	L	L	L
*Lannate (methomyl)	1A	2	2	3	3	3	2-3	2	0	1	3	2	3	1	H	H	H	M	H
*Leverage (cyfluthrin/imidacloprid)	3/4A	3	3	3	3	3	2-3	3	2	3	3	2	3	3	H	H	H	H	H
Lorsban (chlorpyrifos)[a]	1B	—	—	2	3	1	3	3	0	2	2	3	1	1	H	M	M	L	—
§M-Pede (insecticidal soap)	—	0	2-3	0	0	1	0	0	2	1	0	1	0	0	L	L	L	L	L
Malathion	1B	2	2	2	1	1	1	2	0	1	2	—	1	1	H	L[d]	L[d]	L	L
Nexter (pyridaben)	21	—	0	—	—	2	—	—	3	—	—	—	—	—	H	M	L- M[D]	M	M
§oil (Stylet, Damoil, PureSpray)	—	—	—	1	—	—	—	—	2	—	—	3	1	—	L	L- M[b]	L- M[c]	L	L
*Proclaim (emamectin benzoate)	6	0	0	2	3	0	3	1	2	0	3	0	3	0	H	—	—	—	—
*Provado (imidacloprid)	4A	—	3	—	—	3	—	—	2	3	—	2	3	—	H	L	L	M	L
Sevin (carbaryl)	1A	2	1	2	1	3	2	2	0	1	1	2	1	1	H	M	L	H	H
SpinTor, §Entrust (spinosad)	5	2	0	2	3	0	3	0	—	0	3	—	2	0	L	L	L	L	L
*Supracide (methidathion)	1B	—	—	—	—	—	—	—	1-2	3	—	3	—	—	H	—	—	—	—
§Surround (kaolin)	—	2	1	2	2	—	—	2	2	0	—	—	2	0	L	L	L	L	L
*Thionex (endosulfan)	2A	0	2	0	3	3	2	0	0	2	2	1	1	1	M	L	L	M	M
*Vydate (oxamyl)	1A	0	2	0	—	2	0	0	0	2	—	—	3	1	M	H	H	L	M
*Warrior (lambda- cyhalothrin)	3	3	2	3	3	3	2-3	3	2	2	3	1	3	3	H	H	H	H	H

Table 7.1.1. Activity spectrum of pome fruit insecticides and acaricides (continued)

Acaricide	IRAC‡	Ratings for the Control of				Relative Toxicity to Beneficials				
		ARM	ERM	PRM	TSSM	Bees	Af	Tp	Sp	Aa
Acramite (bifenazate)	25	0	3	0	3	M	M	M	L	L
*Agri-Mek, *Abacus, *Abamectin, *Abba, *Abacus, *Abamectin, *Epi-Mek, *Temprano (abamectin)	6	3	3	3	2	L	M	M	M	L
Apollo (clofentezine)	10A	1	3	1	1	L	L	L	L	L
Kanemite (acequinocyl)	20B	—	3	—	3	L	L	L	L	—
Kelthane (dicofol)	—	3	1-2	3	1-2	L	M	L	L	L
Nexter (pyridaben)	21	2	3	2	2	H	M-H[e]	M-H[e]	M	M
§oil (Sunspray, PureSpray, Damoil, Stylet, Omni)	—	2	3	2	1	L	L-M[b]	L-M[c]	L	L
*Proclaim (emamectin benzoate)	6	—	2	—	2	H	—	—	—	—
Savey, Onager (hexythiazox)	10A	—	3	1	1	L	L	L	—	—
*Vendex (hexakis)	12B	2	1-2	2	2-3	L	L	L	L	L
Zeal (etoxazole)	10B	0	3	0	3	L	M	M	—	L

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

Key to control ratings:

— = Unknown or does not apply in this case 0 = not effective 1 = poor 2 = fair 3 = good

[a] = Lorsban 75WG allowed as foliar treatment on apple up to Petal Fall; delayed dormant only in pears. Lorsban 4E and Lorsban 50W used as trunk sprays only on apples after bloom.

‡ = **IRAC** (Insecticide Resistance Action Committee) Mode of Action Classification Group: Arthropod pest populations are more likely to exhibit cross-resistance to materials within the same group.

§ = Potentially acceptable in certified organic programs.

Key to toxicity ratings:	Bees:	L	Low; not hazardous to honey bees at any time. 1 hr to 1 day residual toxicity
		M	Moderate; not hazardous if applied either in evening or early morning when honey bees are not foraging, except during periods of high temperature. 3 hr to 1 day residual toxicity
		H	High; hazardous to honey bees at any time. 1 day to 2 week residual toxicity
	All other Beneficials:	L	low impact on population (less than 30% mortality).
		M	moderate impact on population (between 30% and 70% mortality).
Pesticides with long residual periods (pyrethroids) will have a greater impact than those with a shorter residual (like some organophosphates).		H	high impact on population (more than 70% mortality).
		—	no data.
		[b]	low impact on immatures, moderate impact on eggs.
		[c]	low impact on adults, moderate impact on eggs and immatures. However, general population recovery occurs within 7 days.
		[d]	This information derived from application field tests conducted at the NYS Agricultural Experiment Station.
		[e]	Dependent on rate.

Key to pests:

AM = apple maggot	GFW = green fruitworm	PC = plum curculio	RBLR = redbanded leafroller
Aph = Spirea aphid and apple aphid	Int = Internal Leps (codling moth, oriental fruit moth, lesser appleworm)	PPs = pear psylla	SJS = San Jose scale
ARM = apple rust mite	LH = white apple/potato leafhoppers	PRM = pear rust mite	STLM = spotted tentiform leafminer
ERM = European red mite	OBLR = obliquebanded leafroller	RAA = rosy apple aphid	TPB = tarnished plant bug
			TSSM = twospotted spider mite

Key to beneficials:

Bees = honeybees
Af = *Amblyseius fallacis*, a predatory mite found throughout NYS
Aa = *Aphidoletes aphidimyza*, a cecidomyiid predator of aphids
Tp = *Typhlodromus pyri*, a predatory mite found mostly in western NYS
Sp = *Stethorus punctum*, a ladybird beetle predator of mites

Table 7.1.2. Activity spectrum of stone fruit insecticides.

Insecticide	IRAC‡	APB	Aphids	CFF	JB	OFM	PC	PTB/LPTB	TPB	WFT
Altacor (chlorantraniliprole)	28	—	—	1	—	3	—	—	—	—
*Ambush, *Pounce (permethrin); except plums	3	—	—	3	—	3	3	2	3	2
*Asana (esfenvalerate)	3	1	—	3	—	3	3	3	3	2
Assail (acetamiprid)	4A	—	3	3	3	3	2	--	2	--
§Aza-Direct, §Azatin, §Neemix (azadirachtin)	18B	—	2	—	0	2	0	2	—	—
*Baythroid (cyfluthrin)	3	—	3	3	—	3	3	3	3	—
Beleaf (flonicamid)	9C	—	3	--	—	—	—	—	3	--
Delegate (spinetoram)	5	—	--	3	—	3	2	—	—	3
*diazinon	1B	—	1	3	—	1	2	0	2	—
*Guthion (azinphos-methyl)-cherries only	1B	—	0	3	—	2-3	3	0	2	—
*Imidan (phosmet); except sweet cherries	1B	—	1	3	1	2-3	3	0	2	—
*Lannate (methomyl)	1A	—	2	—	—	2	2	1	2	3
Leverage (cyfluthrin/imidacloprid)	3/4A	0	3	3	3	3	3	3	3	--
Lorsban (chlorpyrifos)	1B	3	2	3	—	—	3	3	—	—
malathion	1B	—	2	1	1	1	2	0	1	—
§M-Pede (insecticidal soap)	—	0	2-3	0	0	0	0	0	0	—
*Provado (imidacloprid)	4A	0	3	0	2	0	1	0	—	—
Sevin (carbaryl)	1A	—	3	3	3	2	2	0	—	1
SpinTor, §Entrust (spinosad)	5	—	—	—	—	—	—	—	—	3
§Surround (kaolin)	—	—	1	2	1	2	2	—	0	—
*Thionex (endosulfan)	2A	0	1	—	—	0	0	3	2	—
*Warrior (*lambda-cyhalothrin)	3	1	3	3	1	3	3	3	3	2

Key to control ratings:

— = unknown or does not apply in this case; **0** = not effective; **1** = poor; **2** = fair; **3** = good

* 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

‡ = **IRAC (Insecticide Resistance Action Committee) Mode of Action Classification Group**: Arthropod pest populations are more likely to exhibit cross-resistance to materials within the same group.

Key to pests:

APB = American plum borer

Aphids = black cherry, green peach aphids

CFF = cherry fruit flies

JB = Japanese beetle

OFM = oriental fruit moth

PC = plum curculio

PTB/LPTB = peachtree borer/lesser peachtree borer

TPB = tarnished plant bug

WFT = western flower thrips

Table 7.1.3. Degree-day accumulations (from Jan. 1) corresponding to selected fruit phenology and arthropod pest events.

Pest/Phenology Event	DD Base 43°F		DD Base 50°F		Approx. Date	
	mean	std dev	mean	std dev	mean	std dev
STLM Traps set out	1-April					
Pear psylla – egg laying	84	44	33	21	4-Apr	11 days
Redbanded leafroller – 1 st catch	142	34	59	20	17-Apr	7 days
Rosy apple aphid – 1 st egg catch	189	55	86	30	25-Apr	7 days
STLM – 1 st adult catch	154	44	66	25	18-Apr	8 days
STLM - 1 st egg observed	208	65	94	36	27-Apr	5 days
Tight cluster (McIntosh)	229	29	105	19	27-Apr	6 days
Tarnished plant bug – 1 st observed	222	105	105	62	25-Apr	15 days
OBLR – 1 st overwintered larvae observed	236	78	112	48	29-Apr	7 days
European red mite – egg hatch observed	284	53	134	34	6-May	4 days
STLM Egg Sample	Pink					
Pink (McIntosh)	294	19	141	18	4-May	6 days
Oriental fruit moth – 1 st adult catch	275	52	130	36	3-May	8 days
STLM – 1 st gen. Adult peak flight	327	63	160	40	7-May	7 days
OBLR Overwintered Gen. Sample	Bloom					
Full bloom (McIntosh)	385	36	196	24	11-May	6 days
San Jose scale – 1 st adult catch	531	88	281	59	21-May	8 days
Cherry fruit fly traps set out	20-May					
Codling moth – 1 st adult catch	489	92	257	58	19-May	7days
STLM – 1 st sap-feeding mines observed	472	129	241	76	18-May	13 days
Petal fall (McIntosh)	484	39	254	26	18-May	6 days
Plum curculio – 1 st oviposition scars observed	555	77	286	37	25-May	9 days
Pear psylla – hardshell stage observed	569	87	312	51	22-May	9 days
Lesser peachtree borer – 1 st adult catch	589	103	319	66	25-May	8 days
ERM Sample – 2.5 mites/leaf	1-Jun					
OBLR traps set out	1-Jun					
STLM traps – change lure	1-Jun					

Abbreviations:

ERM = European red mite

OBLR = Obliquebanded leafroller

OFM = Oriental fruit moth

RBLR = Redbanded leafroller

STLM = Spotted tentiform leafminer

Note: Information in above table is based on field observations. Values and dates are given +/- one standard deviation; i.e., events should occur within the stated range approximately 7 yr out of 10. This information is provided as a scouting and sampling guide.

Table 7.1.3. Degree-day accumulations (from Jan. 1) corresponding to selected fruit phenology and arthropod pest events. (continued)

Pest/Phenology Event	DD Base 43°F		DD Base 50°F		Approx. Date	
	mean	std dev	mean	std dev	mean	std dev
OBLR – 1 st adult catch, 1 st summer brood	883	56	521	46	9-Jun	6 days
Peachtree borer – 1 st adult catch	1057	289	633	196	17-Jun	11 days
STLM – 2 nd gen. 1 st adult catch	1067	87	651	69	16-Jun	7 days
San Jose scale – 1 st crawlers observed	1124	91	688	69	19-Jun	8 days
OBLR – peak catch	991	148	599	108	15-Jun	7 days
Apple maggot – 1 st fly catch (non-orchard)	1424	196	909	125	2-Jul	9 days
Apple Maggot Traps Set Out (in orchard)					1-Jul	
ERM Sample – 5.0 mites/leaf					1-Jul	
Comstock mealybug tape traps set out					1 Jul (ENY), 15 (WNY)	
OFM – 2 nd gen. 1 st adult catch	1382	107	877	92	30-Jun	5 days
OBLR Summer Gen. 1st Sample					10-Jul	5 days
STLM Summer Gen. 1st Sample					9-Jul	7 days
RBLR – 2 nd gen. 1 st catch	1418	168	903	133	1-Jul	6 days
Lesser peachtree borer – peak catch	1370	469	887	331	1-Jul	17 days
STLM – 2 nd gen. peak catch	1589	207	1030	164	8-Jul	9 days
RBLR – 2 nd gen. Peak catch	1762	222	1160	170	14-Jul	7 days
ERM Sample – 7.5 mites/leaf					1-Aug	
OBLR traps – change lure					1-Aug	
Cherry fruit fly traps in					1-Aug	
Comstock mealybug – 2 nd gen. crawlers emerging	2447	196	1651	141	9-Aug	12 days
OBLR – 1 st adult catch, 2 nd summer brood	2455	200	1677	161	8-Aug	9 days
STLM – 3 rd gen. peak catch	2792	222	1922	169	22-Aug	9 days
All Traps In					30-Aug	

Abbreviations:

ERM = European red mite

OBLR = Obliquebanded leafroller

OFM = Oriental fruit moth

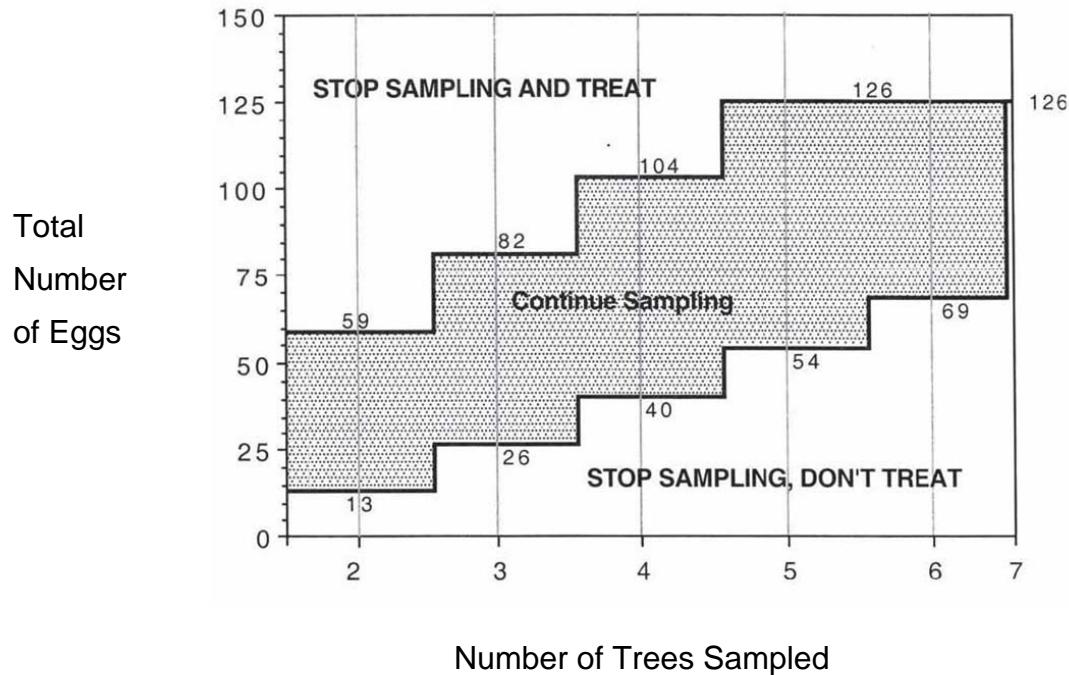
RBLR = Redbanded leafroller

STLM = Spotted tentiform leafminer

Note: Information in above table is based on field observations. Values and dates are given +/- one standard deviation; i.e., events should occur within the stated range approximately 7 yr out of 10. This information is provided as a scouting and sampling guide.

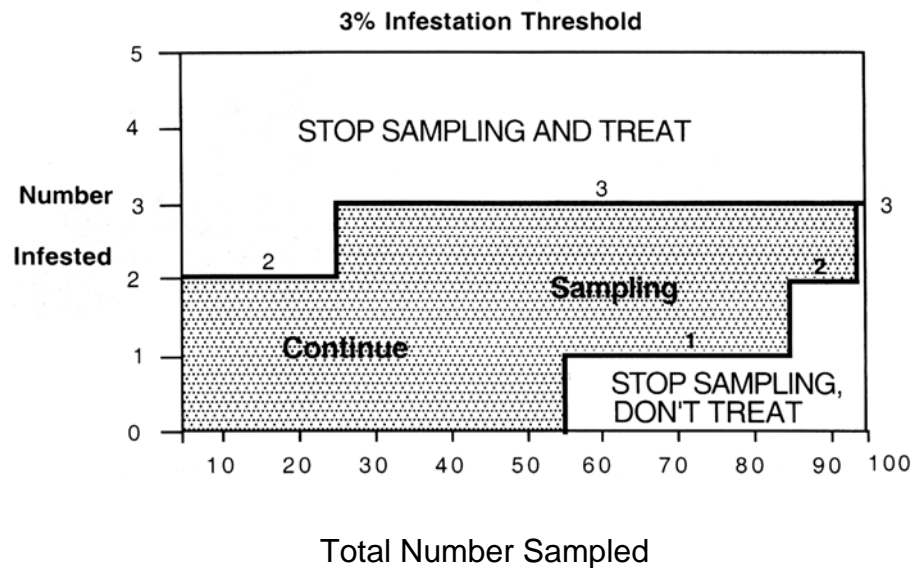
Figure 7.1.1 - STLM Pink Sampling Form

- During the pink bud or early bloom stage, start near one corner of the block, and go to every other tree until you have sampled enough trees to reach a decision. Select 3 fruit clusters from around the canopy of each tree sampled.
- Using a magnifier, count the eggs on the undersides of the 2nd, 3rd, and 4th leaves in each cluster, counting leaves in the order they unfolded (see diagram at right).
- After 2 trees have been sampled, begin comparing the accumulated total number of eggs found with the decision lines shown in the chart below for that number of trees.



- If the number of eggs falls in the "Continue Sampling" zone, sample another tree. If the total is in the "Stop Sampling, Don't Treat" zone, sampling is stopped and no treatment is recommended. If the total is in the "Stop Sampling and Treat" zone, sampling is stopped and a treatment is recommended at either pink or petal fall. If 7 trees are sampled and the total number of eggs equals 126, the population is below threshold.

Refer to the Apple Pesticide Spray Table for a choice of pesticide materials,

Figure 7.1.2 - Obliquebanded Leafroller Sampling Form

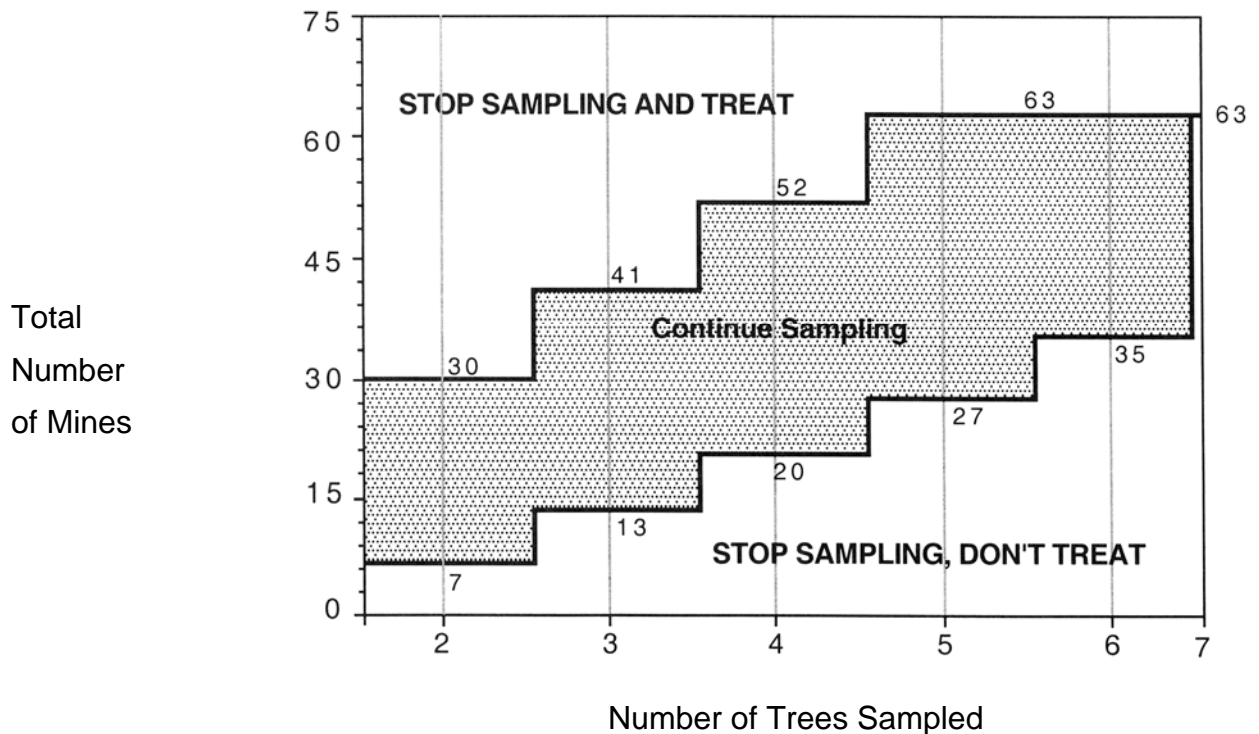
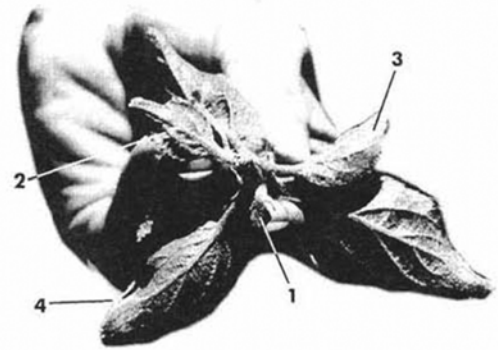
- Examine 10 bud clusters (overwintering generation) or expanding terminals (1st summer generation) per tree for live OBLR larvae. For the 1st summer generation, sample at ~600 degree-days (43°F base) after the 1st moth flight in your area; if you do not have access to this information, use July 5 as an estimated best sample date in WNY (5-7 days earlier in ENY and Long Island).
- Sample every other tree starting with a random tree and continuing down the row. Remember that you are NOT counting OBLR larvae, but sites infested with LIVE OBLR. If trees are >10ft tall, try to include some samples from the upper canopy, or from watersprouts.
- If the total number of infested samples falls in the "Continue Sampling" zone, sample another tree. If the total falls in the "Stop Sampling, Don't Treat" zone, sampling is stopped and no treatment is recommended. If the total falls in the "Stop Sampling and Treat" zone, sampling is stopped and treatment is recommended. Refer to the Apple Pesticide Spray Table for a choice of pesticide materials.
- Continue sampling until you REACH one of the boldface staircase lines in the chart above, or until you have examined a maximum of 100 clusters. If you reach the intersection of the two lines by the 100th sample, withhold treatment.
- If a no-treat decision is made for 1st summer generation larvae, resample again in 3-5 days (after approximately 100 DD more have accumulated). A second no-treat decision indicates that no treatment is recommended against this brood of OBLR.

Use this table to keep track of your samples

Total Number Examined	# Infested	Total Number Examined	# Infested
10	_____	60	_____
20	_____	70	_____
30	_____	80	_____
40	_____	90	_____
50	_____	100	_____

Figure 7.1.3 - STLM Petal Fall Sampling Form

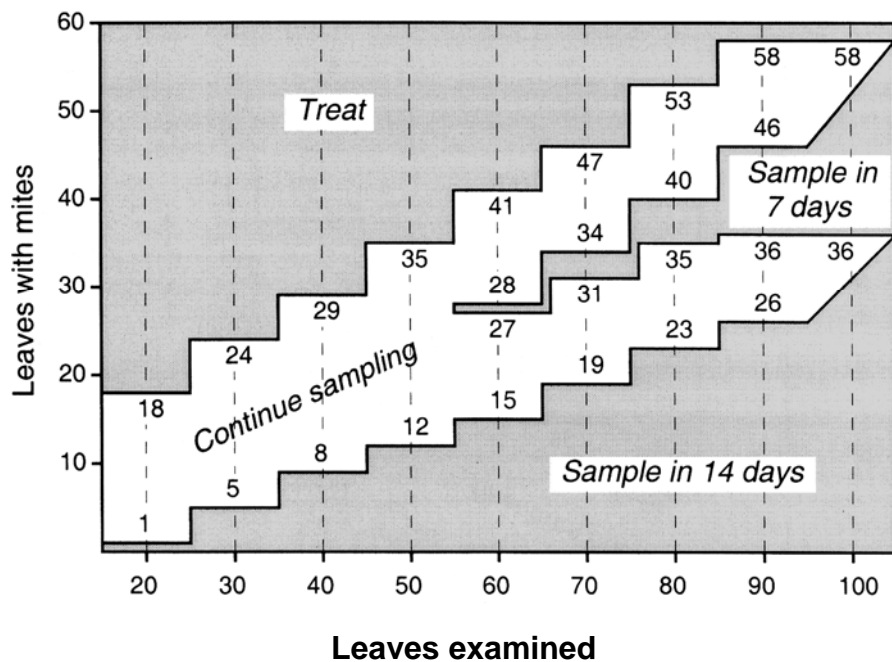
- If STLM eggs were not sampled during the pink or early bloom stage, a decision on 1st generation control can still be made by sampling sap-feeding mines at petal fall. After all the blossoms have fallen, start near one corner of the block, and go to every other tree until you have sampled enough trees to reach a decision. Select 3 fruit clusters from around the canopy of each tree sampled.
- Using a magnifier, count the mines on the undersides of the 2nd, 3rd, and 4th leaves in each cluster, counting leaves in the order they unfolded (see diagram at right).
- After 2 trees have been sampled, begin comparing the accumulated total number of mines found with the decision lines shown in the chart below for that number of trees.



- If the number of mines falls in the "Continue Sampling" zone, sample another tree. If the total is in the "Stop Sampling, Don't Treat" zone, sampling is stopped and no treatment is recommended. If the total is in the "Stop Sampling and Treat" zone, sampling is stopped and a treatment is recommended at petal fall. If 7 trees are sampled and the total number of mines equals 63, the population is below threshold.

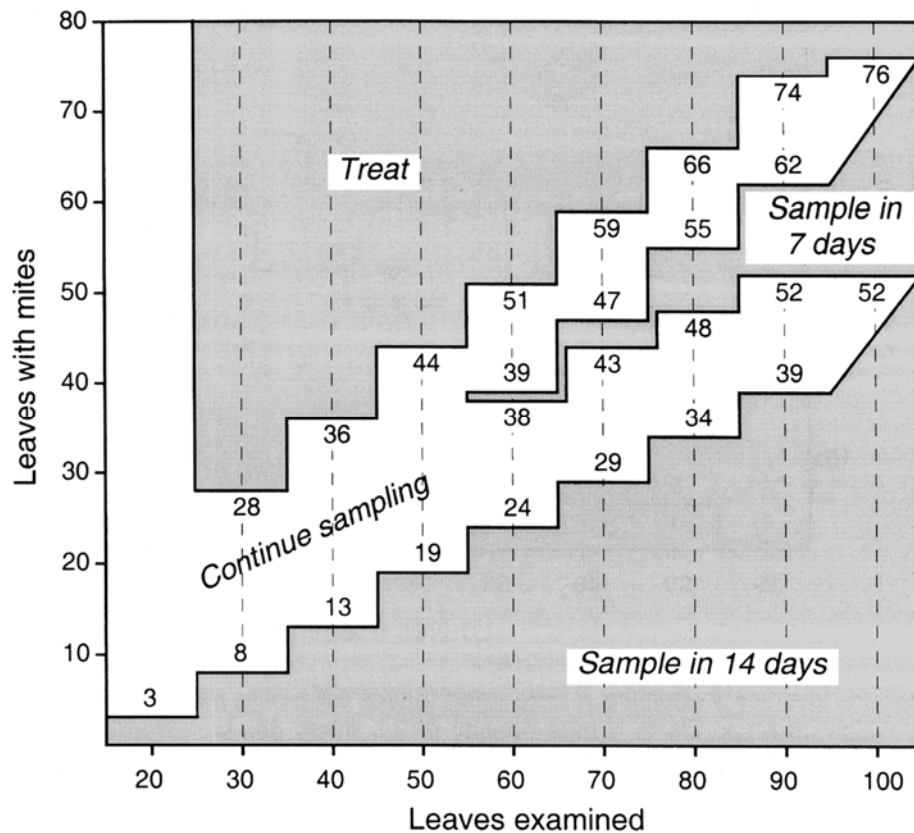
Refer to the Apple Pesticide Spray Table for a choice of pesticide materials.

Figure 7.1.4 – Mite Sampling Chart
Threshold = 2.5 mites/leaf
(June 1 - 30)



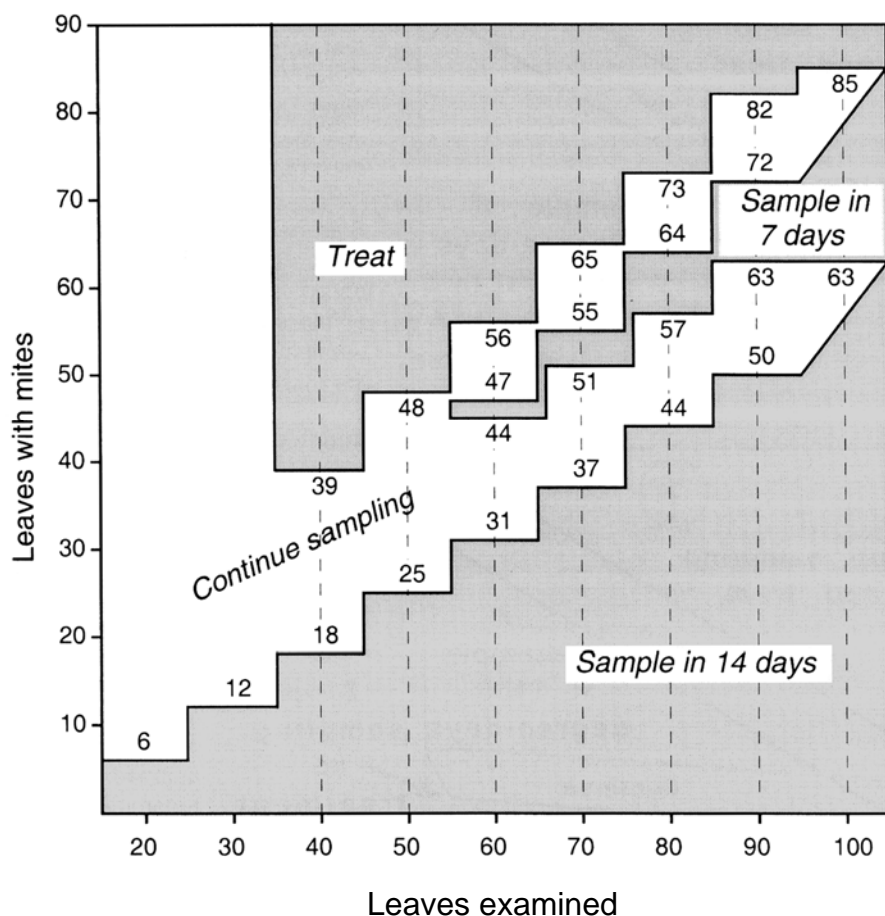
- This procedure involves examining middle aged leaves for motile mites (any stage except eggs). Use this chart, which corresponds to a mite density of 2.5 mites per leaf, from June 1 until June 30. You will not be counting mites, but will only determine whether they are present or absent on each leaf sampled.
- Starting with a random tree and sampling every other tree, collect 4 leaves in a plastic bag from each of 5 trees, choosing from each quadrant of the canopy. To make sure the leaves are of an intermediate age, pick them from the middle of the fruit cluster.
- Using a magnifier, examine the top and bottom surface of each leaf for motile mites, and keep track of the number of leaves containing motile mites. When all 20 leaves have been examined, compare this number with the numbers on the above decision guide. If the number of leaves with mites is equal to the values on the stairstep lines, the decision is the one shown in the area immediately below the value (example: For "29" after sampling 40 leaves, the decision is "Continue sampling"; for "8" the decision is to "Sample in 14 days").
- When the counts fall into any of the shaded regions, sampling is stopped and a decision is made to either treat, or else re-sample in 7 or 14 days. If the counts fall in the "Continue sampling" zone, take and examine more leaf samples in batches of 10 (5 per tree) until the counts fall into one of the shaded regions. If you reach one of the resample zones, the population is below threshold, and should remain so for at least the number of days stated. Return at the designated time and conduct another sample. If the -7 day" resample date falls during the 5.0 mites/leaf Threshold period, you can wait for a total of 14 days before resampling.

Figure 7.1.5 - Mite Sampling Chart
Threshold = 5.0 mites/leaf
(July 1 - 31)

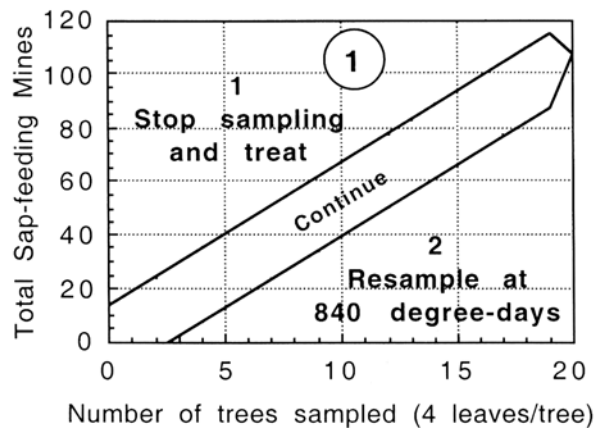


- This procedure involves examining middle aged leaves for motile mites (any stage except eggs). Use this chart, which corresponds to a mite density of 5.0 mites per leaf, from July 1 until July 31. You will not be counting mites, but will only determine whether they are present or absent on each leaf sampled.
- Starting with a random tree and sampling every other tree, collect 4 leaves in a plastic bag from each of 5 trees, choosing from each quadrant of the canopy. To make sure the leaves are of an intermediate age, pick them from the middle of the fruit cluster or foliar terminal.
- Using a magnifier, examine the top and bottom surface of each leaf for motile mites, and keep track of the number of leaves containing motile mites. When all 20 leaves have been examined, compare this number with the numbers on the above decision guide. If the number of leaves with mites is equal to the values on the stairstep lines, the decision is the one shown in the area immediately below the value (example: For "36" after sampling 40 leaves, the decision is "Continue sampling"; for "13" the decision is to "Sample in 14 days"). When the counts fall into any of the shaded regions, sampling is stopped and a decision is made to either treat, or else re-sample in 7 or 14 days. If the counts fall in the "Continue sampling" zone, take and examine more leaf samples in batches of 10 (5 per tree) until the counts fall into one of the shaded regions. If you reach one of the resample zones, the population is below threshold, and should remain so for at least the number of days stated. Return at the designated time and conduct another sample. If the "7 day" resample date falls during the 7.5 mites/leaf Threshold period, you Can wait for a total of 14 days before resampling.

Figure 7.1.6 - Mite Sampling Chart
Threshold = 7.5 Mites/Leaf
(August 1 - 15)

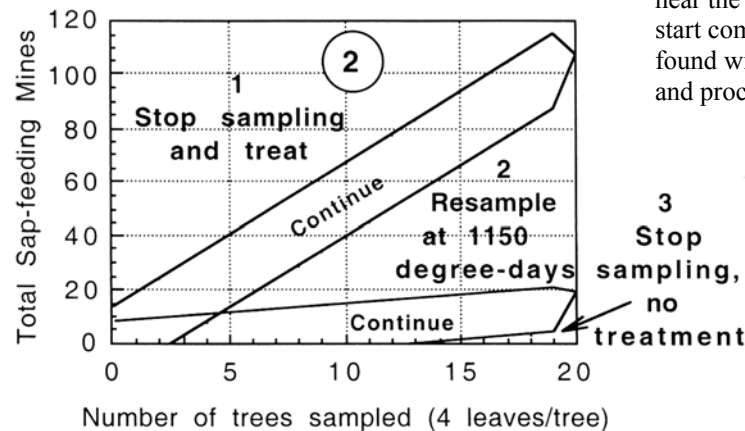


- This procedure involves examining middle aged leaves for motile mites (any stage except eggs). Use this chart, which corresponds to a mite density of 7.5 mites per leaf, from August 1-15. You will not be counting mites, but will only determine whether they are present or absent on each leaf sampled.
- Starting with a random tree and sampling every other tree, collect 4 leaves in a plastic bag from each of 5 trees, choosing from each quadrant of the canopy. To make sure the leaves are of an intermediate age, pick them from the middle of the fruit cluster or foliar terminal.
- Using a magnifier, examine the top and bottom surface of each leaf for motile mites, and keep track of the number of leaves containing motile mites. When all 20 leaves have been examined, compare this number with the numbers on the above decision guide. If the number of leaves with mites is equal to the values on the stairstep lines, the decision is the one shown in the area immediately below the value (example: For "39" after sampling 40 leaves, the decision is "Continue sampling"; for "18" the decision is to "Sample in 14 days"). When the counts fall into any of the shaded regions, sampling is stopped and a decision is made to either treat, or else re-sample in 7 or 14 days. If the counts fall in the "Continue sampling" zone, take and examine more leaf samples in batches of 10 (5 per tree) until the counts fall into one of the shaded regions. If you reach one of the resample zones, the population is below threshold, and should remain so for at least the number of days stated. Return at the designated time and conduct another sample. If the resample date falls after August 15, there should be no further need for additional samples or miticide sprays this season.

Figure 7.1.7 - STLM Summer Sampling Form

Because of variability in this pest's development from one site to the next, more than one sampling session may be needed to reach a treatment decision for 2nd generation STLM. The first sample should be taken at 690 degree-days (base 43°F) after the start of the 2nd moth flight (or approximately 25-30 days). Use July 9 as an approximate sampling date if you don't have access to pheromone trap catch data.

Start near one corner of the block and sample trees along a diagonal, moving toward the opposite corner of the block. At each tree, count all the **sap-feeding** mines on 4 mature terminal leaves randomly selected from around the outside of the canopy. Sampled leaves should be those located near the middle of the terminals. After sampling 3 trees, start comparing the accumulated total number of mines found with the appropriate chart for the sampling session and proceed as follows:



SAMPLING DONE AT 690-840 DD

If the number of mines falls in the "Continue" zone on **Chart 1**, sample another tree and check again. If the total is above this zone (area 1), sampling is stopped and a treatment is recommended. If the total is below this zone (area 2), stop sampling and sample the block again at approximately 840 DD (about 31 days) after the start of the 2nd flight.

SAMPLING DONE AT 840-1149 DD, IF NECESSARY

If it is necessary to sample the population a second time, refer to Chart 2 after sampling the 3rd tree. If the accumulated total falls in one of the "Continue" zones, sample another tree and check again. If the count falls in area 1, a treatment is recommended and no further sampling is necessary. If the count falls in area 2, stop sampling and sample the block again at approximately 1150 DD (about 42 days) after the start of the 2nd flight. If the count falls in area 3, treatment is not recommended and no further sampling is necessary.

SAMPLING DONE AT 1150 OR MORE DD, IF NECESSARY

If it is necessary to sample a third time, refer again to **S**, the same as in the first sampling session. This time, however, if the accumulated total number of mines falls in area 2, treatment is not recommended and no further sampling is required for this brood of STLM.

Refer to the Apple Pesticide Spray Table for a choice of pesticide materials if a treatment is elected.

Figure 7.1.8 – Apple Maggot Monitoring Form

On or before July 15, hang 3 sticky red sphere traps baited with apple volatile lures in the trees along the edge of your block closest to an abandoned orchard or a stand of woods. If no abandoned trees or woodlands are nearby, choose the southern edge of the block. Traps should be spaced at least 30 ft from each other, on the outside edge of the canopy, at least 6 ft. high. Position the traps so that they are surrounded by fruit and foliage, but are not touched by them or obstructed from view. Traps should be checked 1-2 times per week for Apple Maggot flies, which can be distinguished from similar species by the pattern of dark bands on their wings (right). If a total of 5 AM flies/trap are caught (or 15, in this case), a spray of a suitable insecticide is recommended immediately, after which the traps can be ignored for 7-14 days. (Refer to the Apple Pesticide Spray Table for a choice of pesticide materials.) Begin checking the traps again after this period of protection by the spray, periodically and re-coated with stickum if necessary. No treatment is required if no flies are caught. If unbaited sphere traps are used, the threshold should be 15 flies/trap. In New England, it may be better to leave traps up until August 30. In blocks with very early varieties ("summer apples")

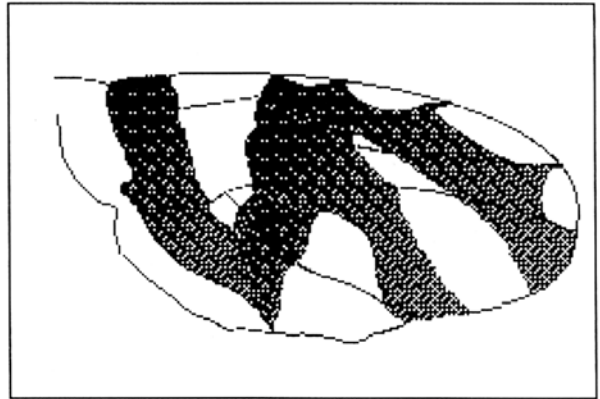
[illegible]

Figure 7.1.9. Apple Events Calendar for the Lake Plains Area of New York

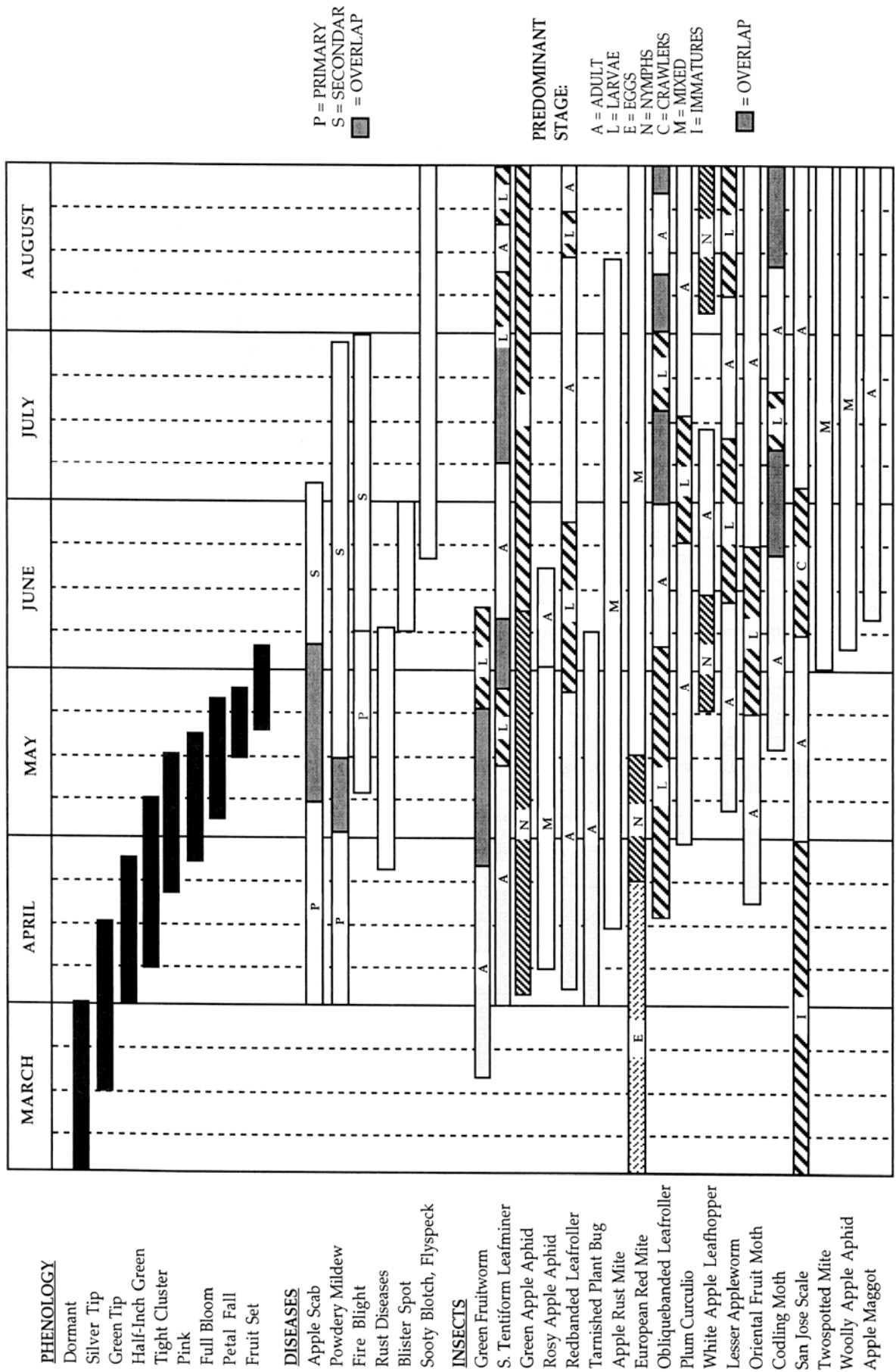


Figure 7.1.10. Pear Events Calendar for the Lake Plains Area of New York

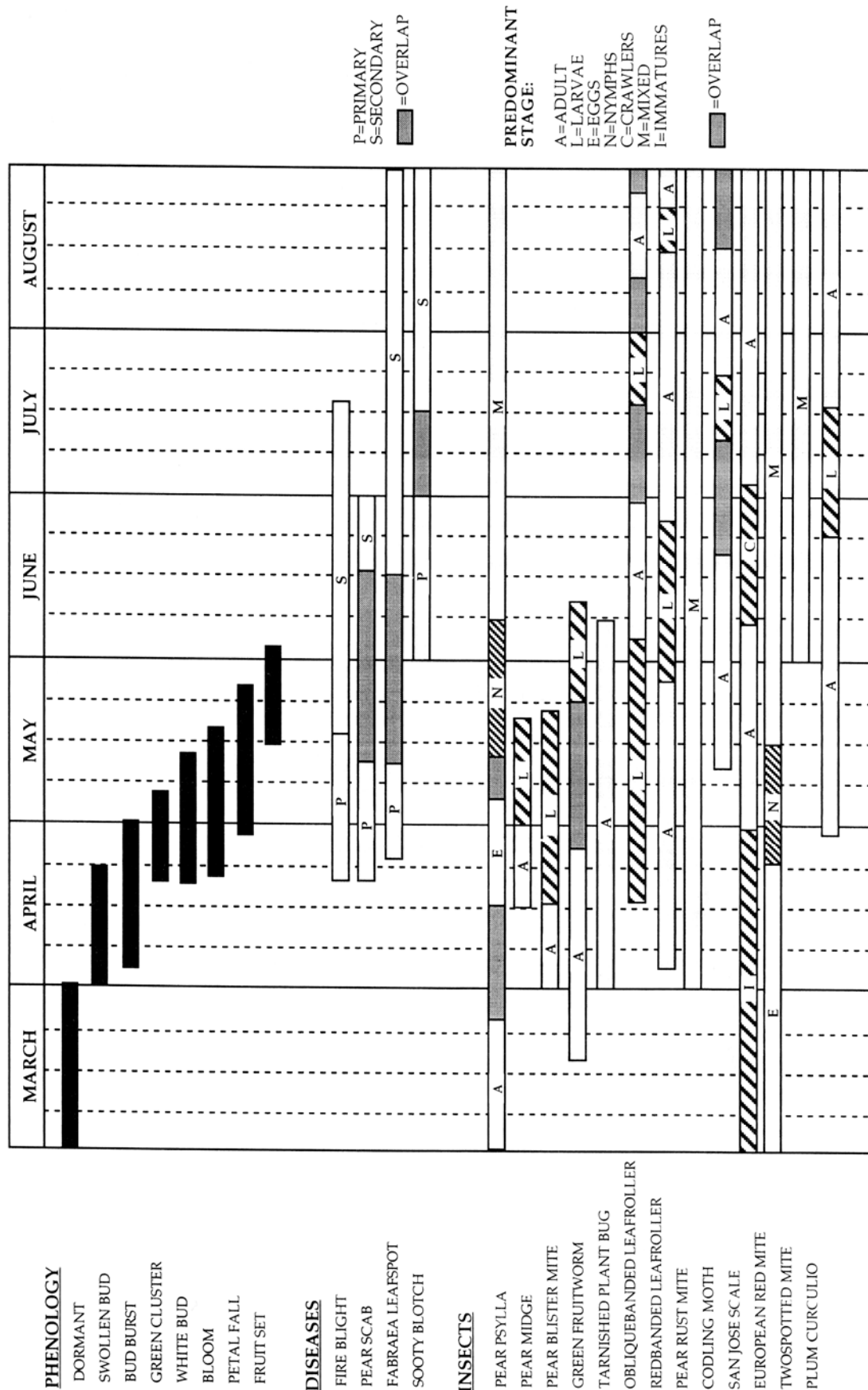


Figure 7.1.11. Cherry Events Calendar for the Lake Plains Area of New York

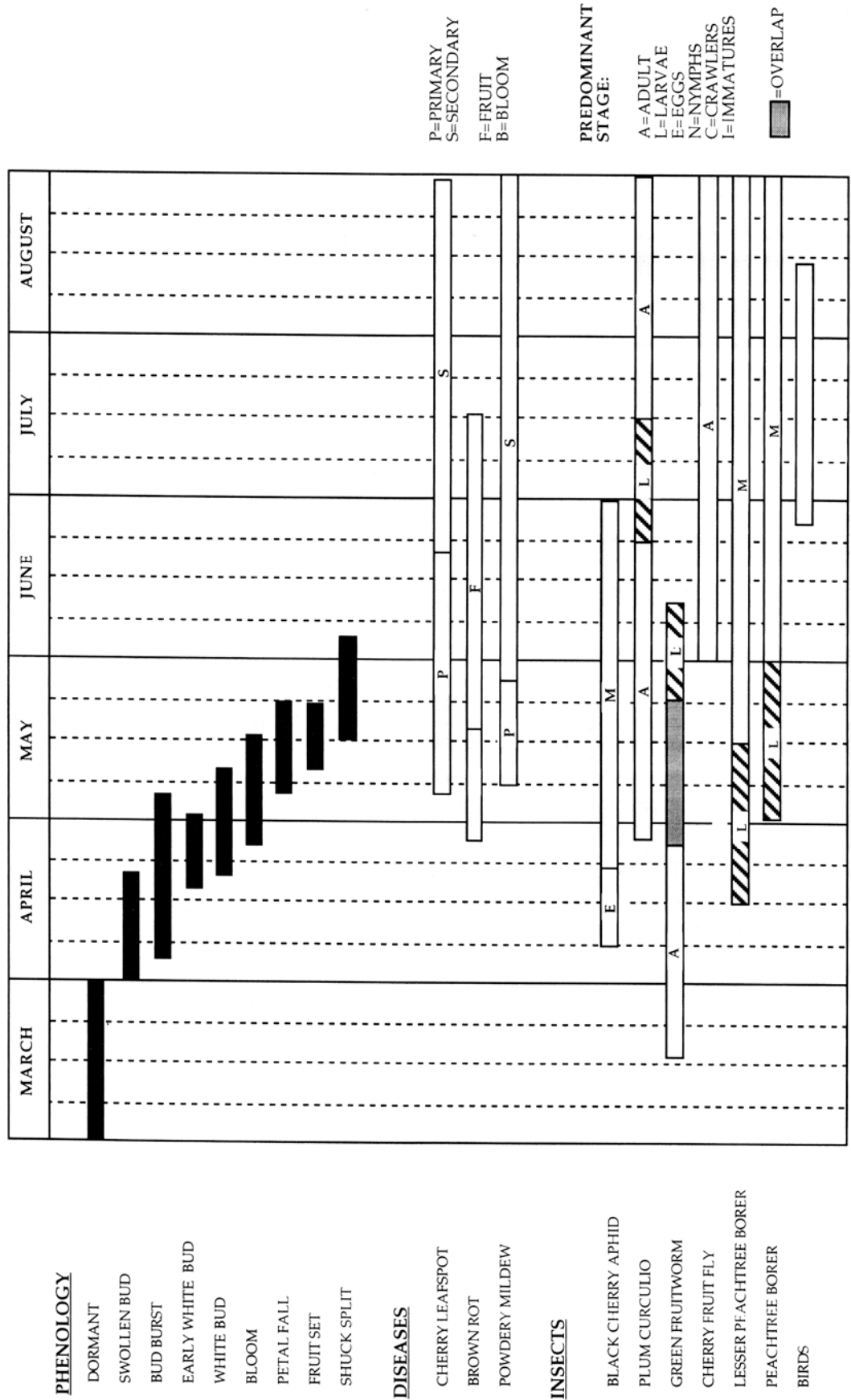


Figure 7.1.12. Peach Events Calendar for the Lake Plains Area of New York

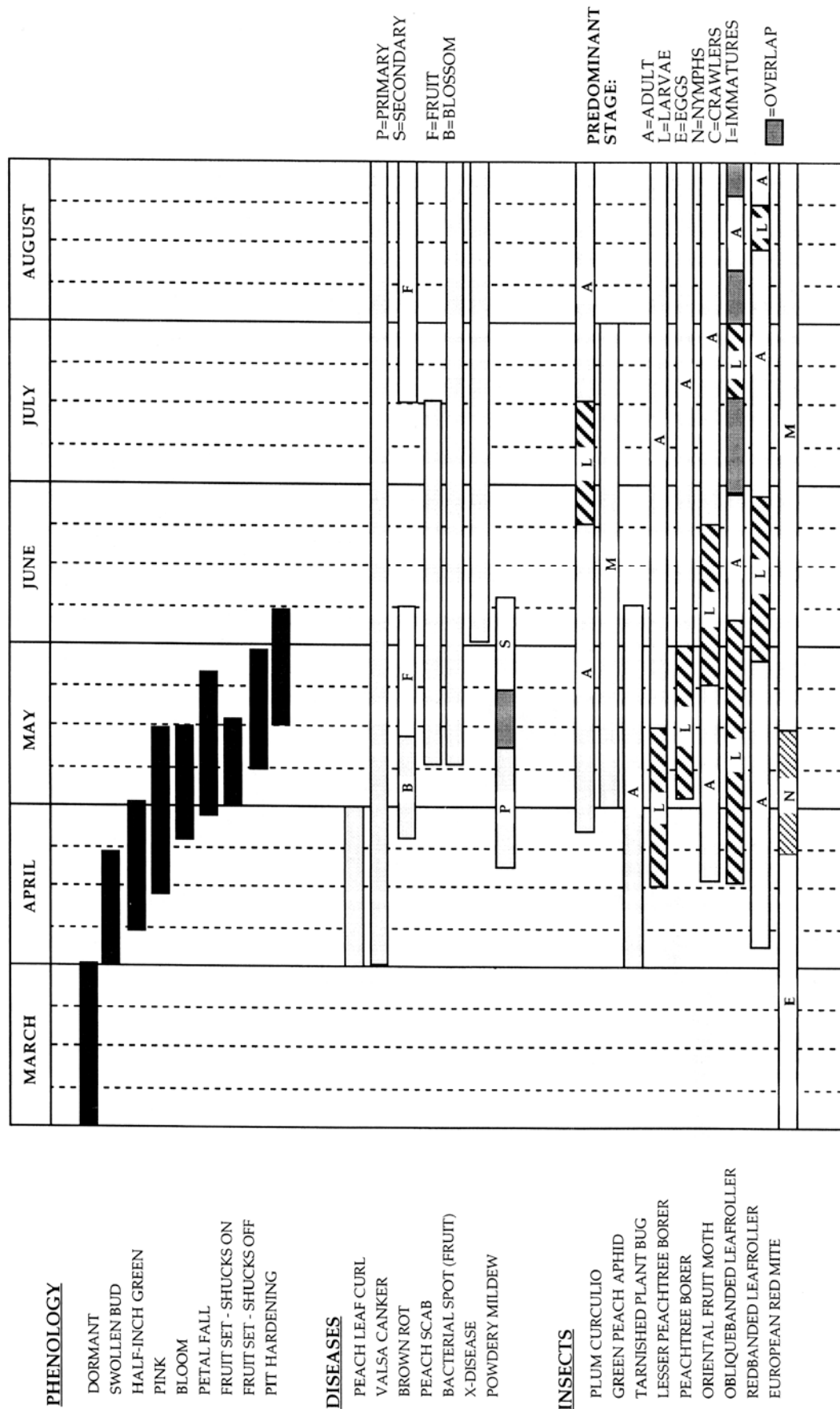


Figure 7.1.13. Prune and Plum Events Calendar for the Lake Plains Area of New York

