

7 Insect and Mite Management

Table 7.1.1. Activity spectrum of pome fruit insecticides and acaricides.

| Insecticide | Ratings for the Control of | | | | | | | | | | | | | Relative Toxicity to Beneficials | | | | | |
|--|----------------------------|----|-----|-----|-----|----|------|----|-----|-----|------|-----|------|----------------------------------|------|--------|--------|----|----|
| | IRAC ² | 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 (abamectin) | 6 | — | — | — | — | 3 | — | — | 3 | — | — | — | 3 | — | L | M | M[d] | M | — |
| *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 | 1 | 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 |
| §B.t. (§Btobit, §Dipel, §Javelin, MVP) | 11B2 | 0 | 0 | 2 | 3 | 0 | 3 | 0 | 0 | 0 | 3 | — | 0 | 0 | L | L[d] | L[d] | L | L |
| *Baythroid (cyfluthrin) | 3 | 3 | 2 | 3 | 3 | 3 | 2-3 | 3 | — | — | 3 | — | 3 | 3 | H | H | H | H | H |
| *Calypso (thiacloprid) | 4A | 3 | 3 | 3 | — | 3 | 1 | 3 | 3 | 1 | 1 | 2 | 3 | 1 | L | L | L | — | — |
| *Dantrol (fenpropathrin) | 3 | 3 | 2 | 3 | 3 | 3 | 2-3 | 3 | 2 | 2 | 3 | 1 | 3 | 3 | H | H | H | H | H |
| *diazinon | 1B | — | 1 | 2 | 2 | 1 | 0 | 2 | 0 | 3 | 0 | 2 | 1 | 1 | H | — | — | 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 | — | 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 |
| 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] | — | — |
| Nexter (pyridaben) | 21 | — | 0 | — | — | 2 | — | — | 3 | — | — | — | — | — | H | M | L-M[D] | M | — |
| Soil (Stylect, Damoil, PureSpray) | — | — | — | 1 | — | — | — | — | 2 | — | — | 3 | 1 | — | L | L-M[b] | L-M[c] | — | — |
| *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 | — |
| 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) | 2.5 | 0 | 3 | 0 | 3 | M | M | M | L | L |
| *Agri-Mek (abamectin) | 6 | 3 | 3 | 3 | 2 | L | M | M | M | — |
| Apollo (clofentezine) | 10A | 1 | 3 | 1 | 1 | L | L | L | L | L |
| Kanemite (acequinocyl) | 20B | — | 3 | — | 3 | 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 | — |
| §oil (Sunspray, PureSpray, Damoil, Stylet, Omni) | — | 2 | 3 | 2 | 1 | L | L-M[b] | L-M[c] | L | — |
| *Proclaim (emamectin benzoate) | 6 | — | 2 | — | 2 | H | — | — | — | — |
| Savey (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 | — | — | — | — |

* 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).
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.

Pesticides with long residual periods (pyrethroids) will have a greater impact than those with a shorter residual (like some organophosphates).

Key to pests:

AM = apple maggot
Aph = Spirea aphid and apple aphid
ARM = apple rust mite
ERM = European red mite
GFW = green fruitworm
Int = Internal Leps (codling moth, oriental fruit moth, lesser appleworm)
LH = white apple/potato leafhoppers
OBLR = obliquebanded leafroller
PC = plum curculio
RBLR = redbanded leafroller
SJS = San Jose scale
STLM = spotted tentiform leafminer
PPS = pear psylla
PRM = pear rust mite
RAA = rosy apple aphid
TSSM = twospotted spider mite
Key to beneficials:
Bees = honey bees
AF = *Amblyseius fallacis*, a predatory mite found throughout NYS
Aa = *Aphidletes 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 | OFM | PC | PTB/LPTB | TPB | WFT |
|--|-------|-----|--------|-----|-----|----|----------|-----|-----|
| *Ambush, *Pounce (permethrin); except plums | 3 | — | — | 3 | 3 | 3 | 2 | 3 | 2 |
| *Asana (esfenvalerate) | 3 | 1 | — | 3 | 3 | 3 | 3 | 3 | 2 |
| §Aza-Direct, §Azatin, §Neemix (azadirachtin) | 18B | — | 2 | — | 2 | 0 | 2 | — | — |
| *Baythroid (cyfluthrin) | 3 | — | 3 | 3 | 3 | 3 | 3 | 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 | 2-3 | 3 | 0 | 2 | — |
| *Lannate (methomyl) | 1A | — | 2 | — | 2 | 2 | 1 | 2 | 3 |
| Lorsban (chlorpyrifos) | 1B | 3 | 2 | 3 | — | 3 | 3 | — | — |
| malathion | 1B | — | 2 | 1 | 1 | 2 | 0 | 1 | — |
| §M-Pede (insecticidal soap) | — | 0 | 2-3 | 0 | 0 | 0 | 0 | 0 | — |
| *Provado (imidacloprid) | 4A | 0 | 3 | 0 | 0 | 1 | 0 | — | — |
| Sevin (carbaryl) | 1A | — | 3 | 3 | 2 | 2 | 0 | — | 1 |
| SpinTor, §Entrust (spinosad) | 5 | — | — | — | — | — | — | — | 3 |
| §Surround (kaolin) | — | — | 1 | 2 | 2 | 2 | — | 0 | — |
| *Thionex (endosulfan) | 2A | 0 | 1 | — | 0 | 0 | 3 | 2 | — |
| *Warrior (*lambda-cyhalothrin) | 3 | 1 | 3 | 3 | 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

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 | 178 | 78 | 78 | 45 | 17-Apr | 7 days |
| Rosy apple aphid – 1 st egg catch | 189 | 55 | 86 | 30 | 25-Apr | 7 days |
| STLM – 1 st adult catch | 175 | 61 | 77 | 37 | 19-Apr | 6 days |
| STLM - 1 st egg observed | 208 | 65 | 94 | 36 | 27-Apr | 5 days |
| Tight cluster (McIntosh) | 227 | 30 | 103 | 18 | 27-Apr | 7 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) | 293 | 18 | 140 | 16 | 4-May | 6 days |
| Oriental fruit moth – 1 st adult catch | 294 | 89 | 142 | 62 | 2-May | 8 days |
| STLM – 1 st gen. Adult peak flight | 331 | 76 | 161 | 47 | 6-May | 7 days |
| OBLR Overwintered Gen. Sample | Bloom | | | | | |
| Full bloom (McIntosh) | 384 | 37 | 195 | 25 | 11-May | 6 days |
| San Jose scale – 1 st adult catch | 492 | 113 | 257 | 69 | 18-May | 9 days |
| Cherry fruit fly traps set out | 20-May | | | | | |
| Codling moth – 1 st adult catch | 500 | 111 | 264 | 73 | 19-May | 8 days |
| STLM – 1 st sap-feeding mines observed | 472 | 129 | 241 | 76 | 18-May | 13 days |
| Petal fall (McIntosh) | 458 | 41 | 255 | 27 | 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 | 587 | 140 | 314 | 92 | 26-May | 8 days |
| ERM Sample – 2.5 mites/leaf | 1-Jun | | | | | |
| OBLR traps set out | 1-Jun | | | | | |
| STLM traps – change lure | 1-Jun | | | | | |

Abbreviations:

ENY = Eastern New York

ERM = European red mite

OBLR = Obliquebanded leafroller

OFM = Oriental fruit moth

RBLR = Redbanded leafroller

STLM = Spotted tentiform leafminer

WNY = Western New York

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 | 916 | 84 | 542 | 62 | 10-Jun | 5 days |
| Peachtree borer – 1 st adult catch | 1064 | 288 | 640 | 197 | 18-Jun | 11 days |
| STLM – 2 nd gen. 1 st adult catch | 1069 | 115 | 650 | 88 | 15-Jun | 7 days |
| San Jose scale – 1 st crawlers observed | 1124 | 91 | 688 | 69 | 19-Jun | 8 days |
| OBLR – peak catch | 1111 | 211 | 684 | 150 | 18-Jun | 10 days |
| Apple maggot – 1 st fly catch (non-orchard) | 1394 | 203 | 892 | 142 | 30-Jun | 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 | 1418 | 146 | 902 | 118 | 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 | 1458 | 204 | 926 | 151 | 1-Jul | 6 days |
| Lesser peachtree borer – peak catch | 1370 | 469 | 887 | 331 | 1-Jul | 17 days |
| STLM – 2 nd gen. peak catch | 1609 | 228 | 1038 | 175 | 7-Jul | 10 days |
| RBLR – 2 nd gen. Peak catch | 1788 | 247 | 1171 | 197 | 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 | 2462 | 189 | 1682 | 154 | 6-Aug | 9 days |
| STLM – 3 rd gen. peak catch | 2828 | 222 | 1953 | 171 | 21-Aug | 10 days |
| All Traps In | | | | | 30-Aug | |

Abbreviations:

ENY = Eastern New York

ERM = European red mite

OBLR = Obliquebanded leafroller

OFM = Oriental fruit moth

RBLR = Redbanded leafroller

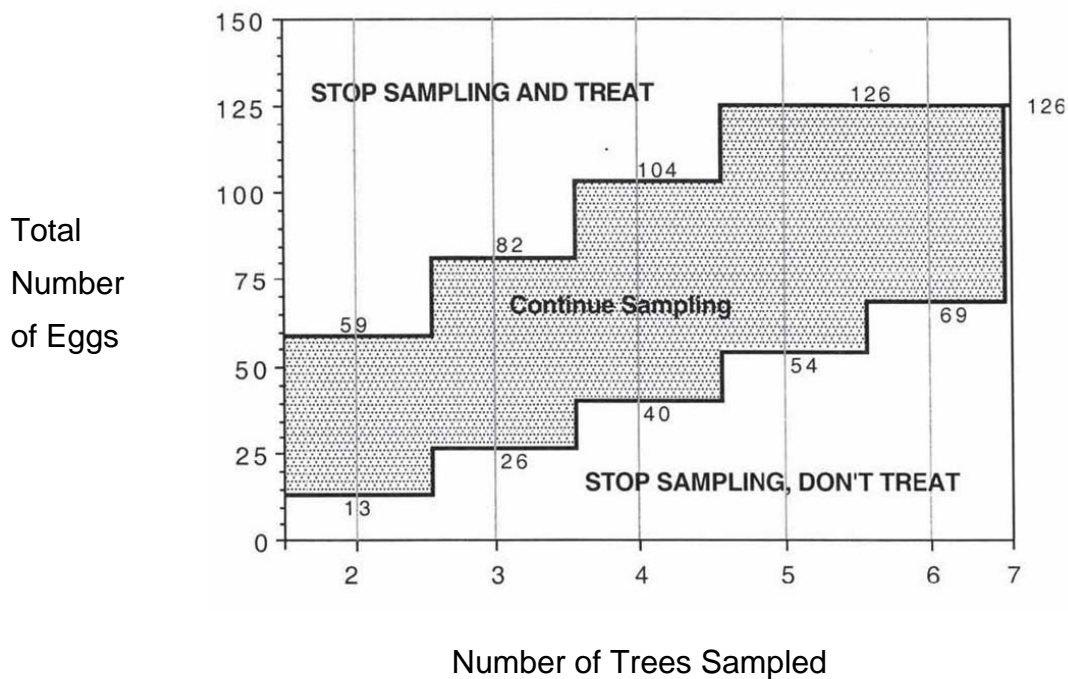
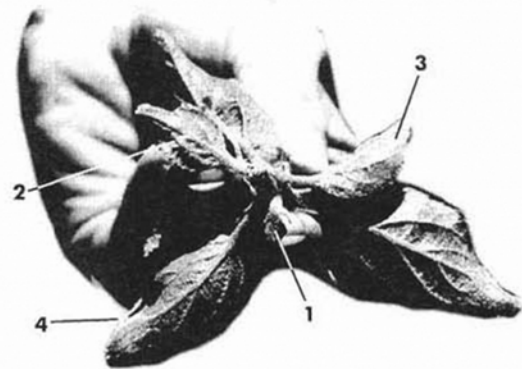
STLM = Spotted tentiform leafminer

WNY = Western New York

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

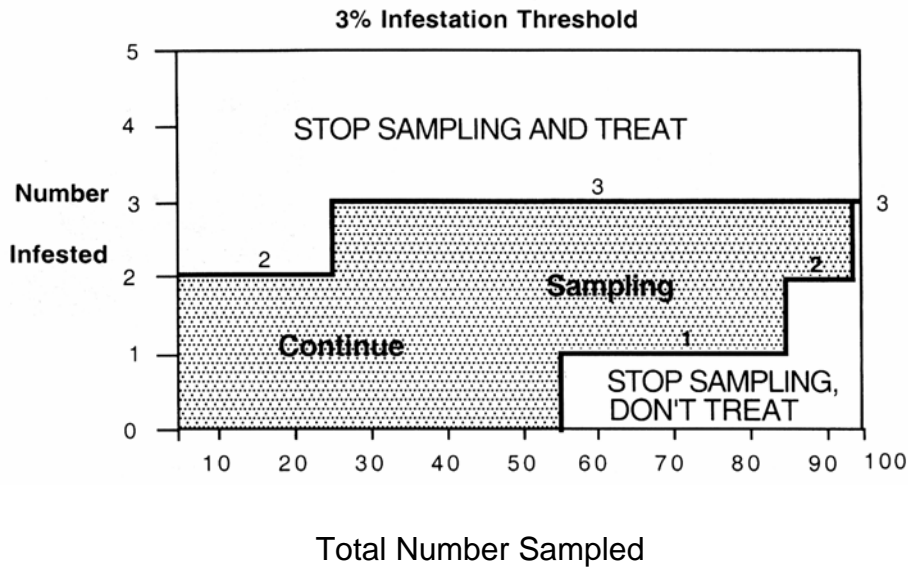
- During the pink bud or early bloom stage, start near one corner of the block, and go to every other tree until you have sampled enough trees to reach a decision, Select 3 fruit clusters from around the canopy of each tree sampled.
- Using a magnifier, count the eggs on the undersides of the 2nd, 3rd, 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



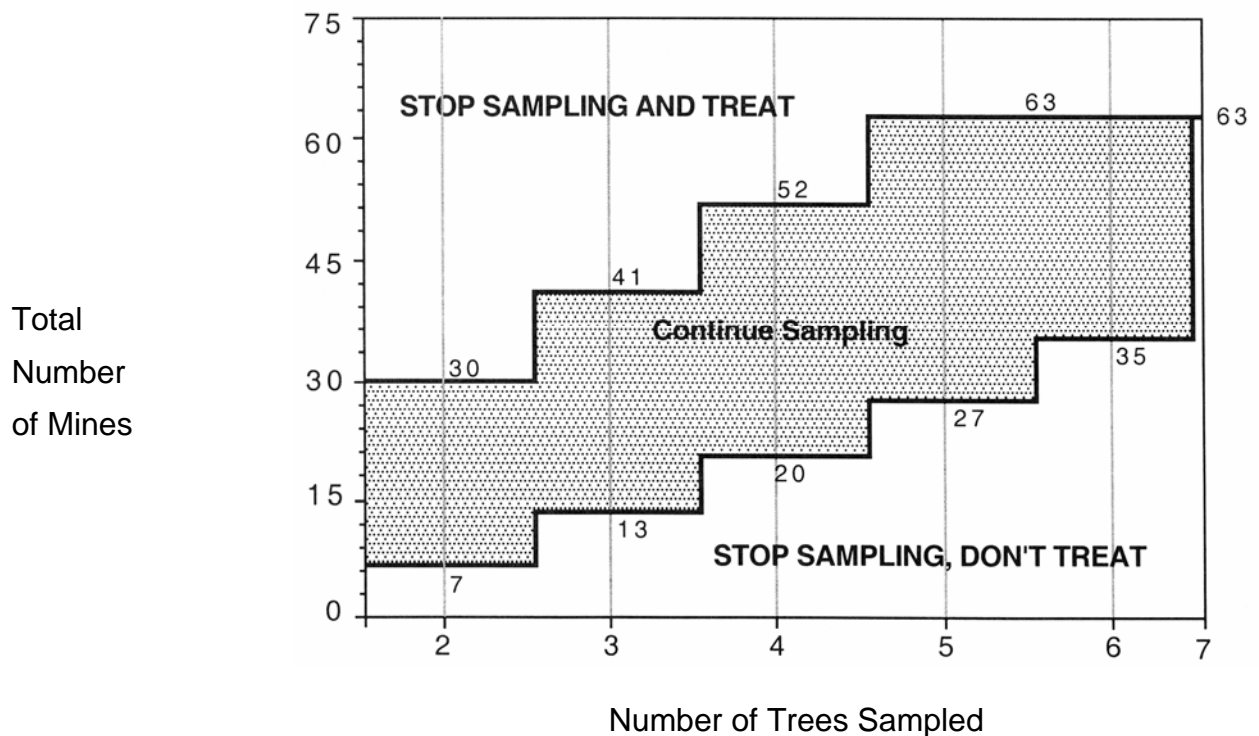
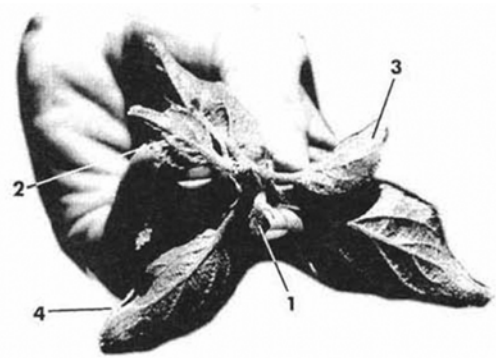
- Examine 10 bud clusters (overwintering generation) or expanding terminals (1st summer generation) per tree for live OBLR larvae. For the 1st summer generation, sample at ~600 degree-days (43°F base) after the 1st moth flight in your area; if you do not have access to this information, use July 5 as 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

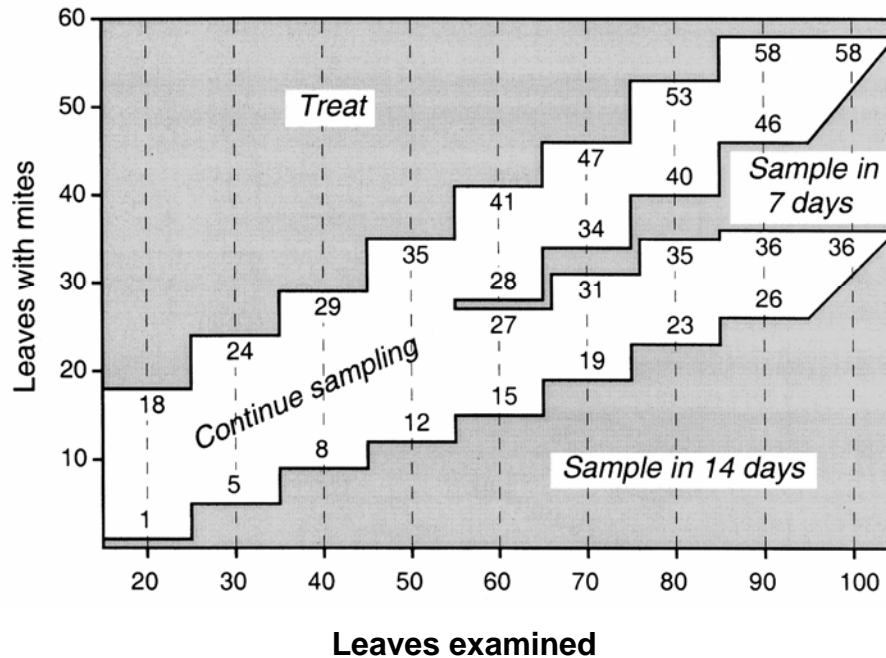
- If STLM eggs were not sampled during the pink or early bloom stage, a decision on 1st generation control can still be made by sampling sap-feeding mines at petal fall. After all the blossoms have fallen, start near one corner of the block, and go to every other tree until you have sampled enough trees 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.

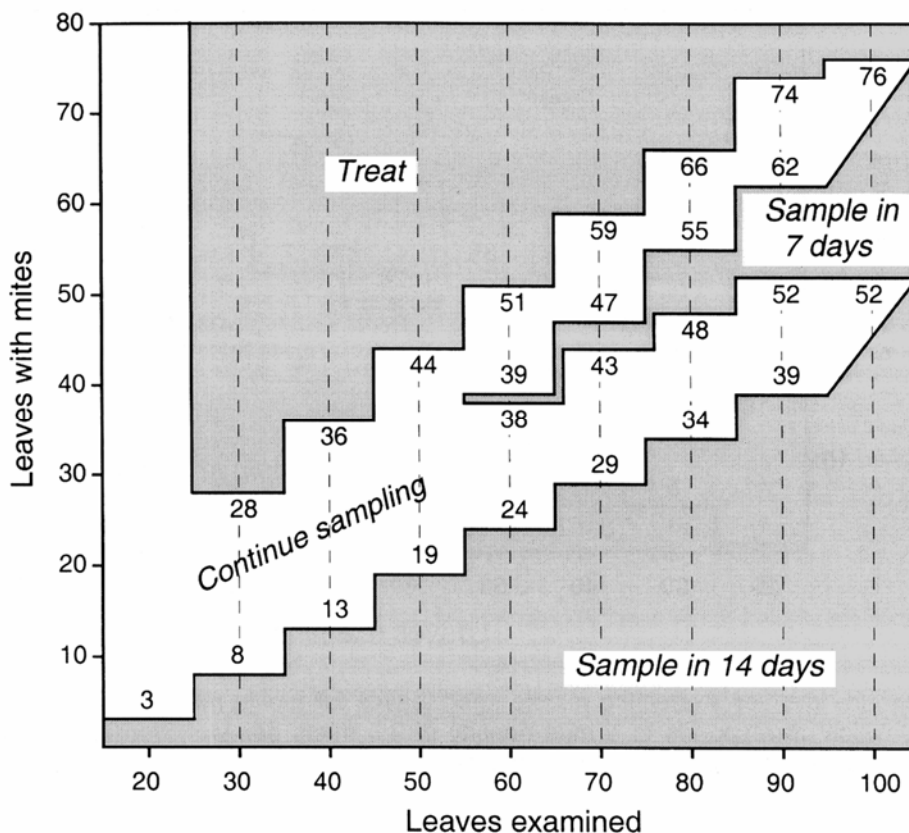
Refer to the Apple Pesticide Spray Table for a choice of pesticide materials.

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



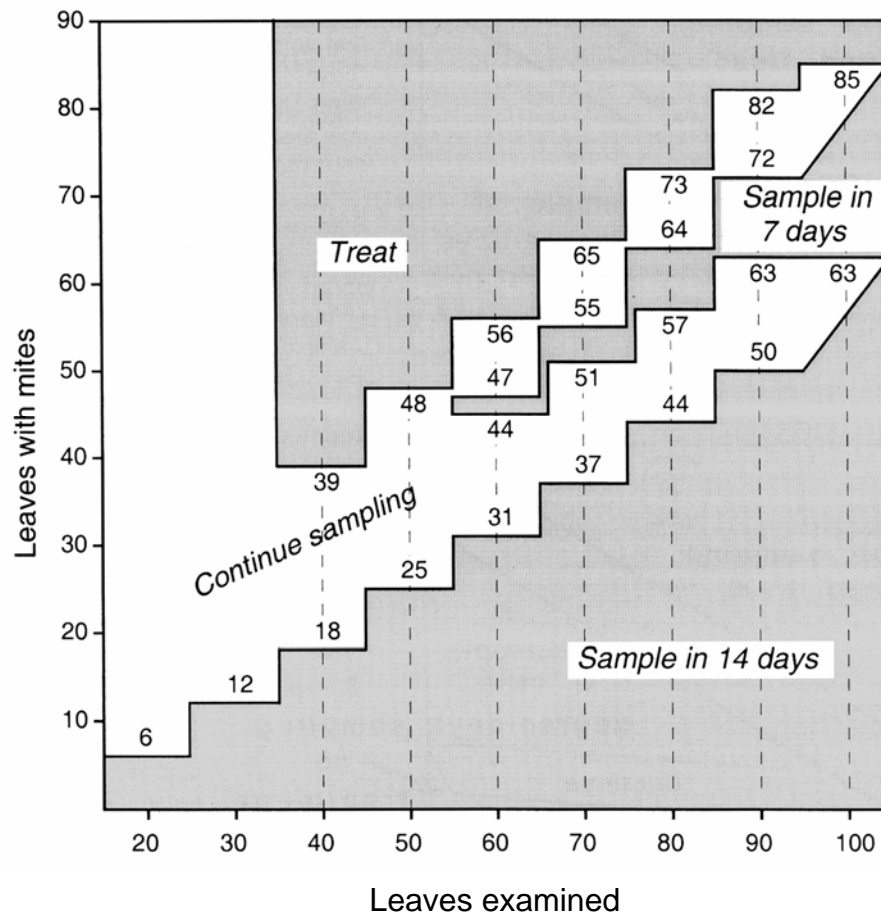
- This procedure involves examining middle aged leaves for motile mites (any stage except eggs). Use this chart, which corresponds to a mite density of 2.5 mites per leaf, from June 1 until June 30. You will not be counting mites, but will only determine whether they are present or absent on each leaf 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)



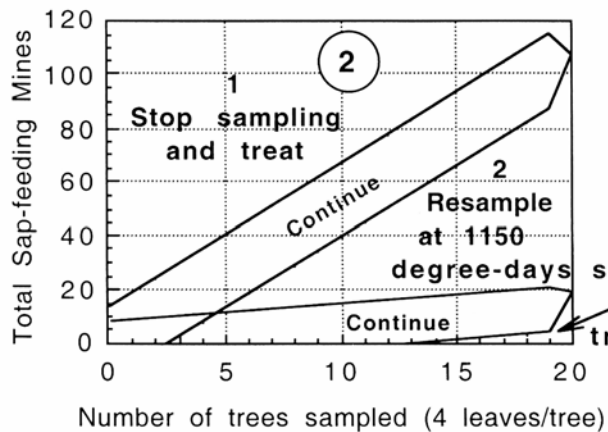
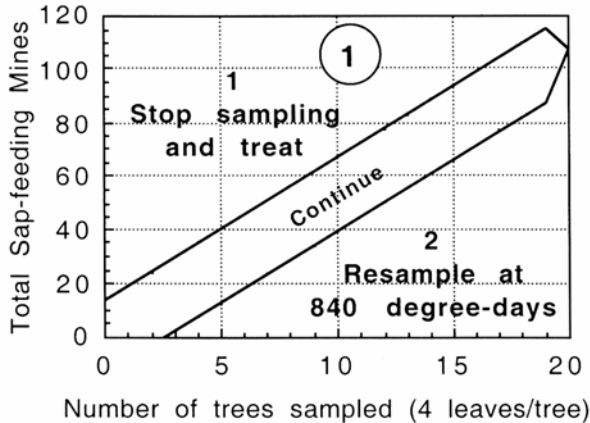
- This procedure involves examining middle aged leaves for motile mites (any stage except eggs). Use this chart, which corresponds to a mite density of 5.0 mites per leaf, from July 1 until July 31. You will not be counting mites, but will only determine whether they are present or absent on each leaf 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 staircase 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.

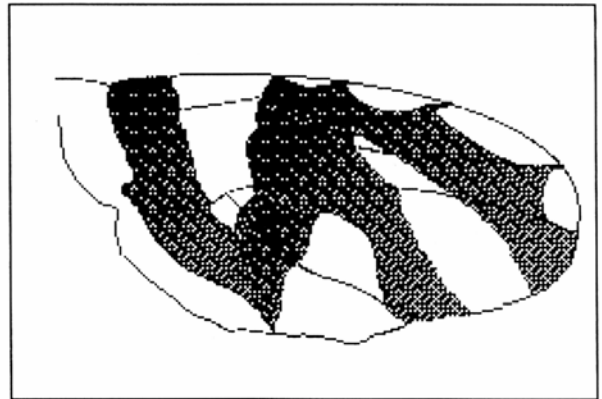
SAMPLING DONE AT 1150 OR MORE DD, IF NECESSARY

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 residue. Traps should be cleaned of non-pest flies periodically and re-coated with stickum if necessary. No treatment is recommended until a cumulative total of 5 AM flies/trap are caught. If un baited sphere traps are used, the threshold should be lowered to 1 AM fly/trap. Traps can be taken down by August 30. In New England, it may be better to leave traps up until September 10, especially in blocks with Cortland or Delicious fruit. In blocks with very early varieties (“summer apples”), July 1 is a more appropriate starting time.



| Date checked | Total number of AM Flies caught since last spray | Total AM flies/3 | Date of last spray | Material/Rate |
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Figure 7.1.9. Apple Events Calendar for the Lake Plains Area of New York

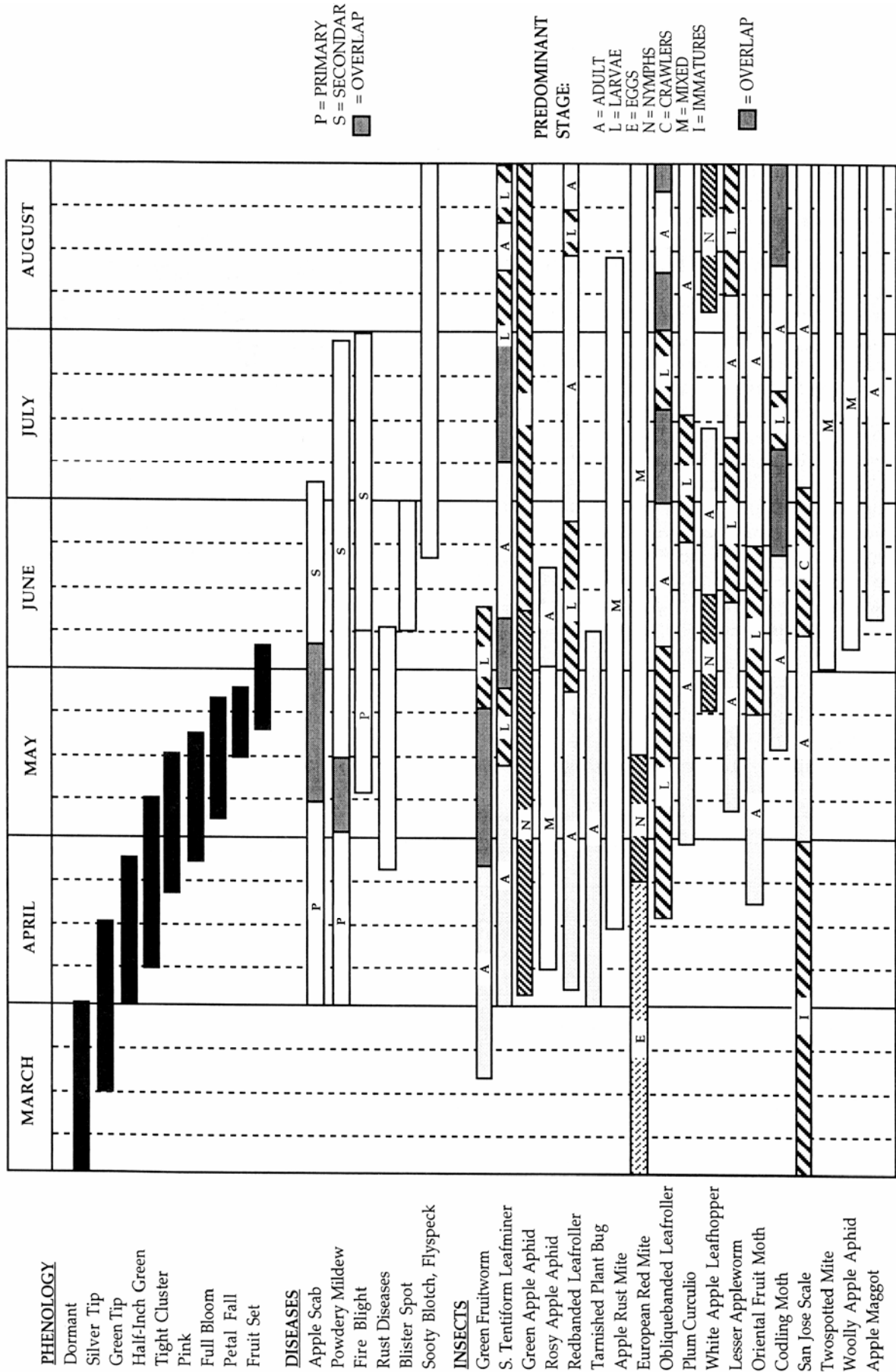


Figure 7.1.10. Pear Events Calendar for the Lake Plains Area of New York

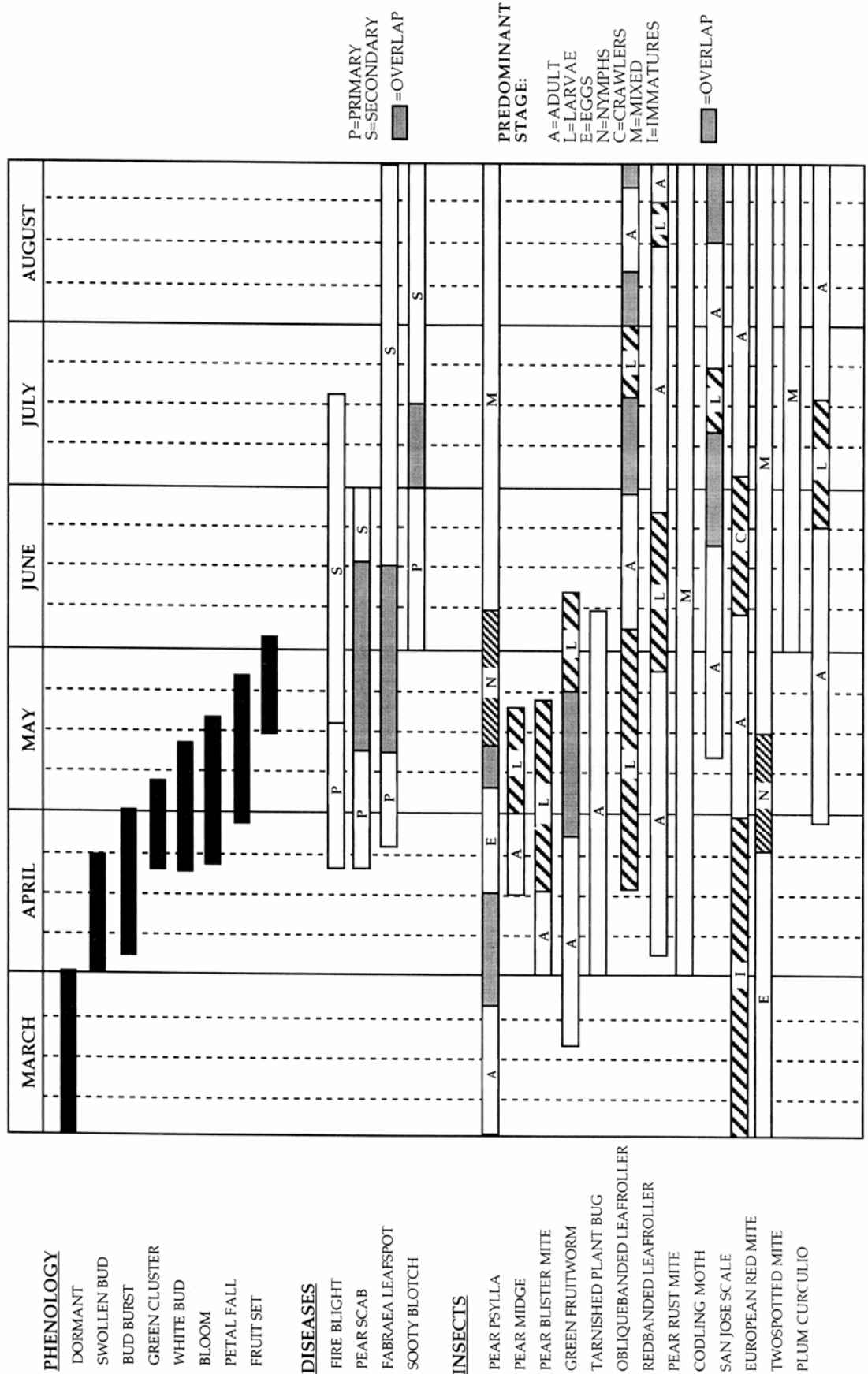


Figure 7.1.11. Cherry Events Calendar for the Lake Plains Area of New York

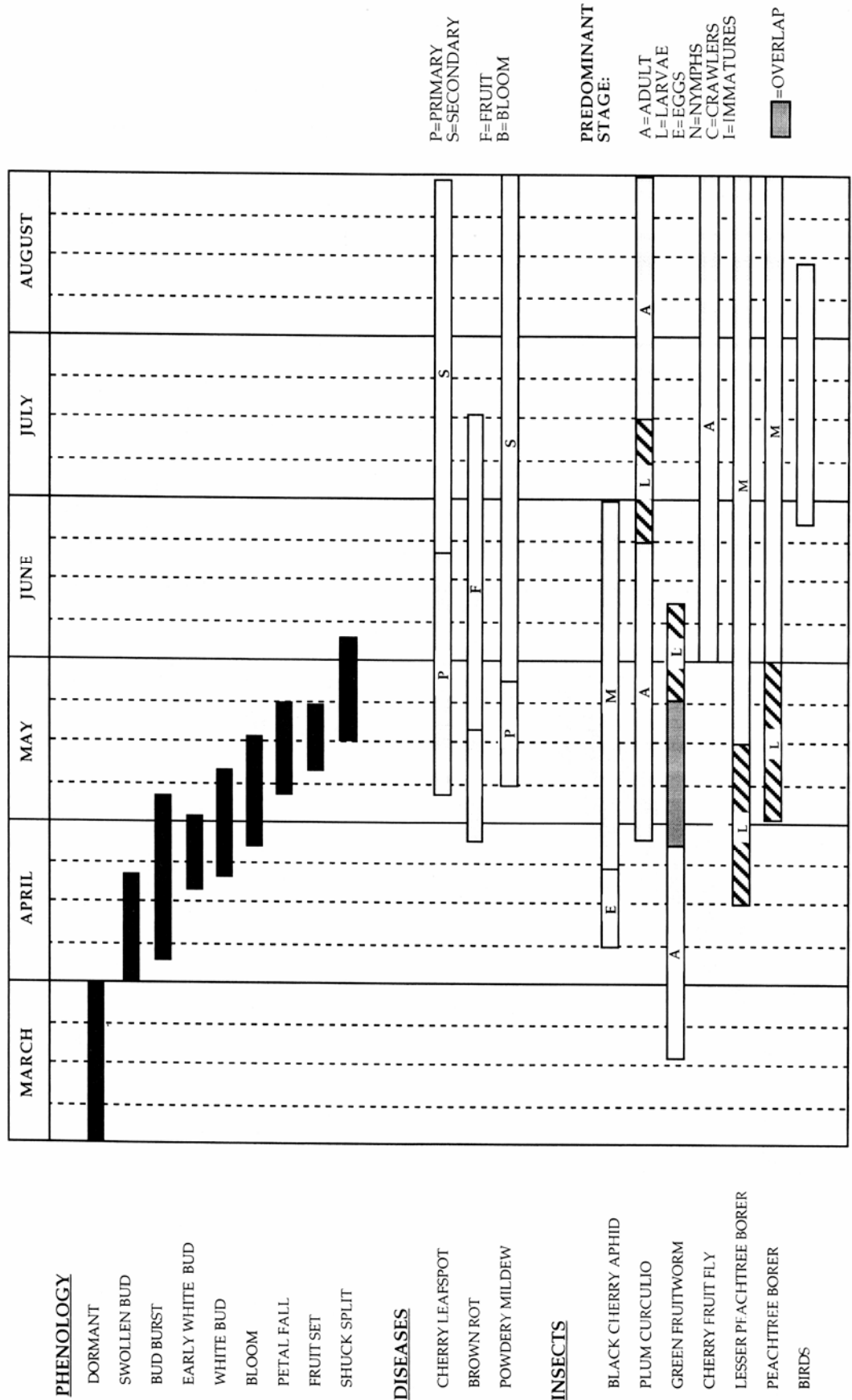


Figure 7.1.12. Peach Events Calendar for the Lake Plains Area of New York

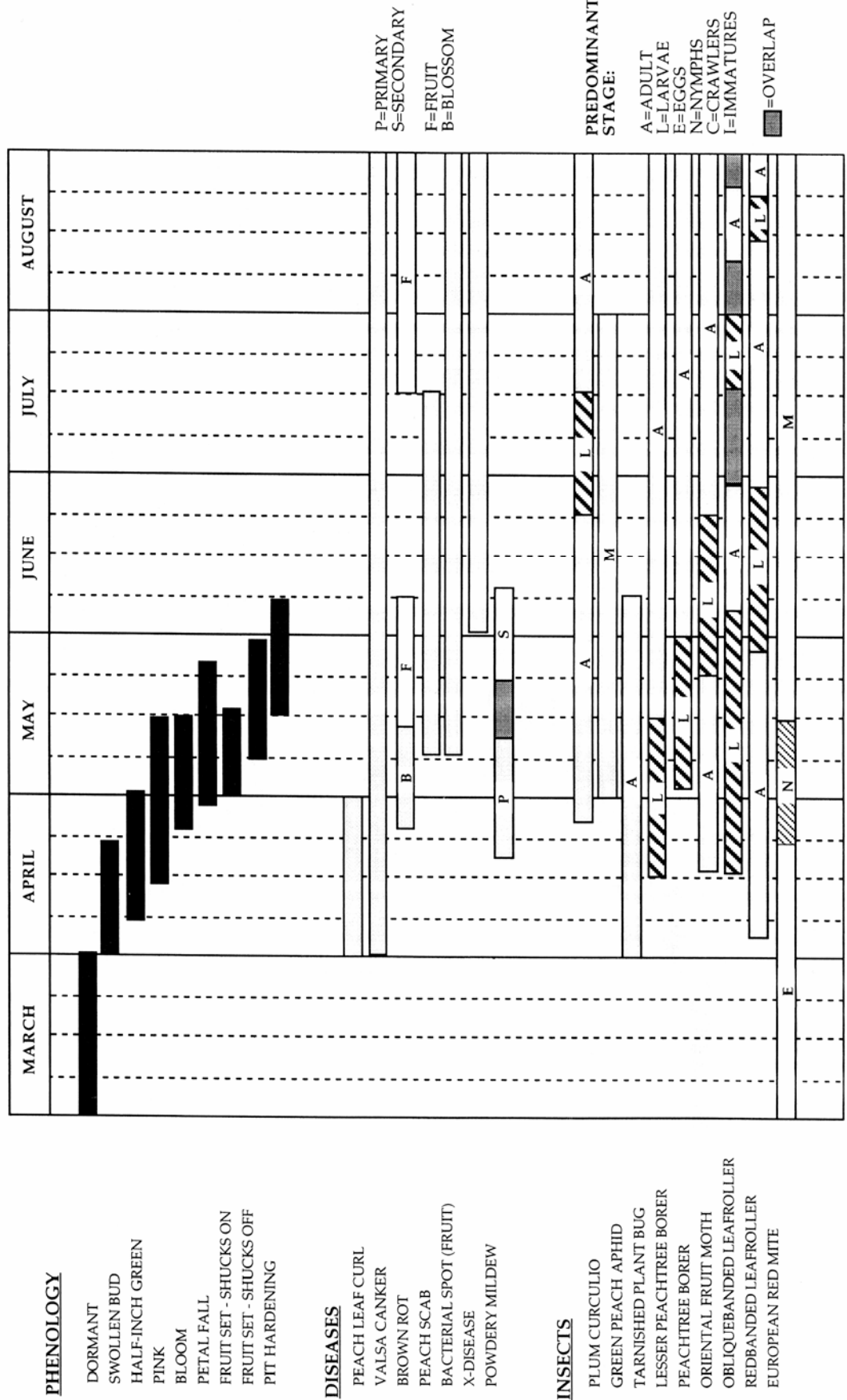
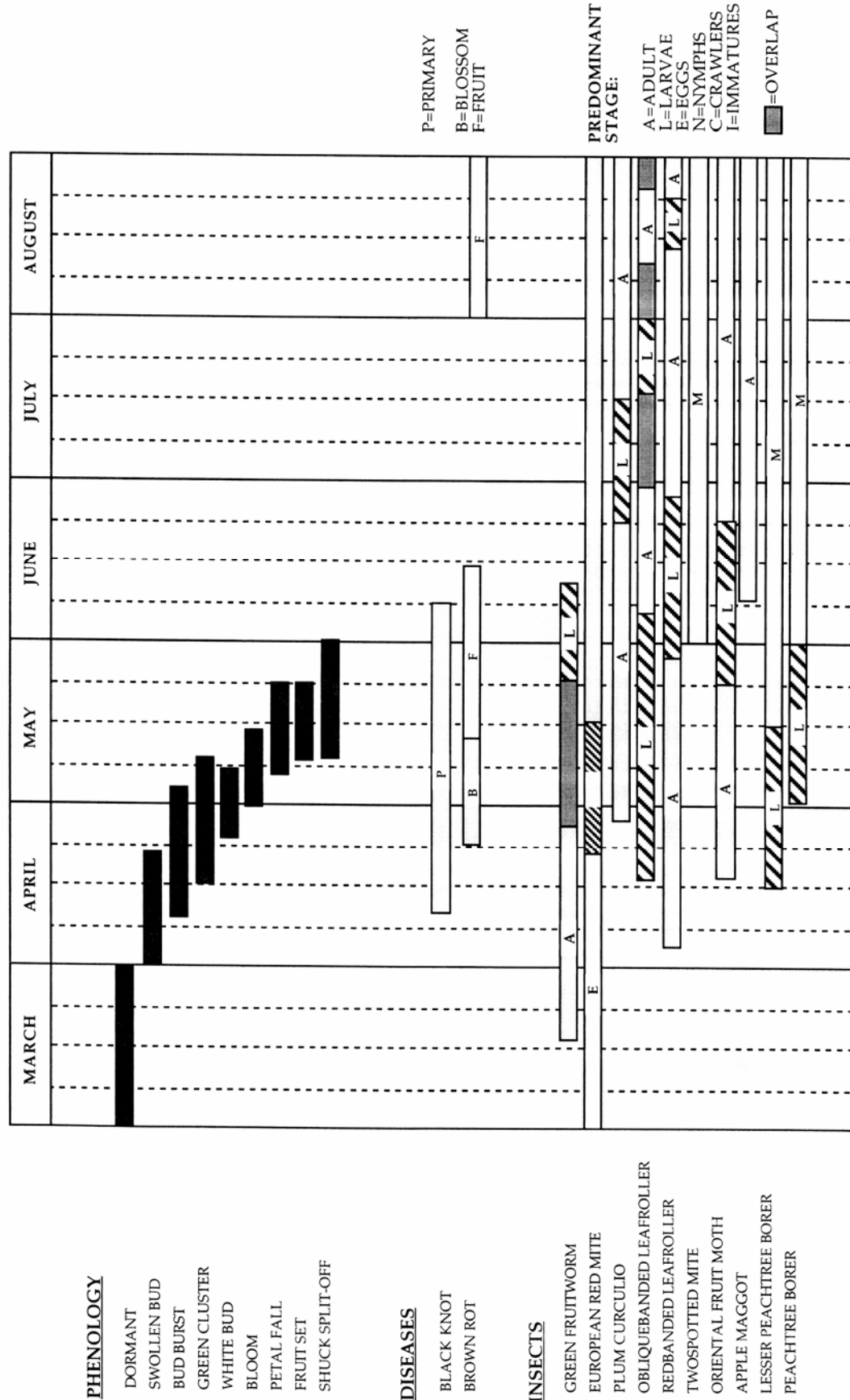
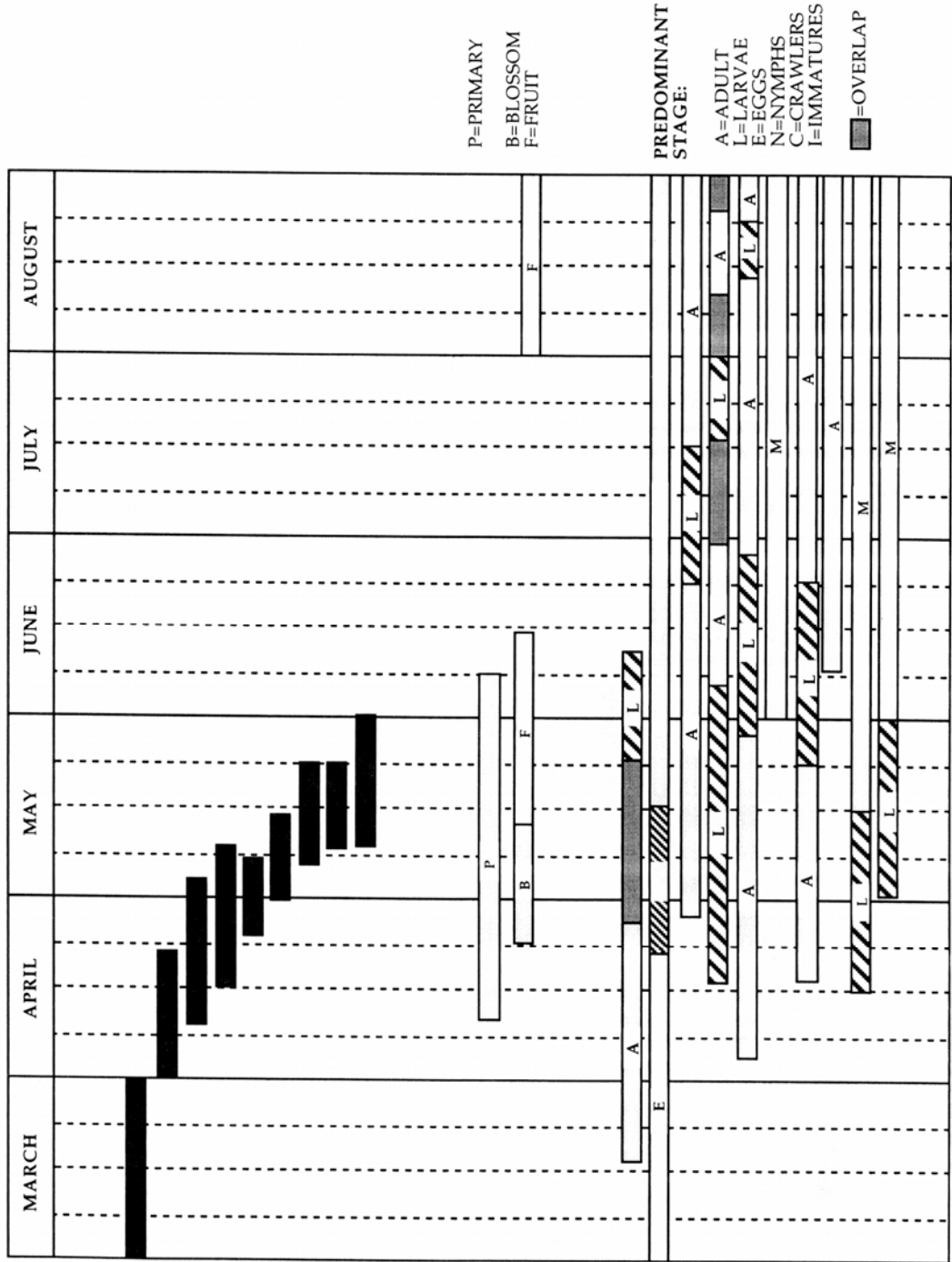


Figure 7.1.13. Prune and Plum Events Calendar for the Lake Plains Area of New York





PHENOLOGY

- DORMANT
- SWOLLEN BUD
- BUD BURST
- GREEN CLUSTER
- WHITE BUD
- BLOOM
- PETAL FALL
- FRUIT SET
- SHUCK SPLIT-OFF

DISEASES

- BLACK KNOT
- BROWN ROT

INSECTS

- GREEN FRUITWORM
- EUROPEAN RED MITE
- PLUM CURCULIO
- OBLIQUEBANDED LEAFROLLER
- REDBANDED LEAFROLLER
- TWOSPOTTED MITE
- ORIENTAL FRUIT MOTH
- APPLE MAGGOT
- LESSER PEACHTREE BORER
- PEACHTREE BORER