



Strategies For Total Insect Management With and Without BMSB

Dean Polk

Statewide Fruit IPM Agent

And what if we don't use mating disruption?

(You Should)

And get rid of the flowering weeds in groundcover?

(You Should)

Monitoring and choosing insecticides for everything.



Materials and Ratings Effective for BMSB

Product Name	BMSB Rating	Peach				Pome fruit				IRAC	Class
		Rate	Seasonal No. apps or material	PHI	Interval (days)	Rate	Seasonal No. apps or material	PHI	Interval (days)		
Actara*	+++	5.5 oz	11 oz	14	7	5.5 oz	16.5 oz	35	10	4A	Neonicotinoid
Perm-up**	+++	10 oz	3	14	10	N/A	N/A	N/A	N/A	3A	Pyrethroid
Asana	++	14.5 oz	5	14	N/A	14.5 oz	7	21	N/A	3A	Pyrethroid
Assail	+++	0.15 lbs	4	7	10	0.15 lbs	4	7	12	4A	Neonicotinoid
Azera	++	16-56 oz	10	0	3	16-56 oz	10	0	3		Pyrethrin + neem extract
Baythroid	+++	2.4 oz	5.6 fl oz	7	14	2.4 oz	2.8 oz	7	14	3A	Pyrethroid
Belay	++++	6 fl oz	2	21	10	6-12 oz	12 oz	7	14	4A	Neonicotinoid
Bifenture Brigade Capture <i>(SECTION 18 required for Apples and Peaches)</i>	++++	12.8 oz	28.8 oz after PF, season total 32 oz.	14	30	12.8 oz	28.8 oz after PF, season total 32 oz.	14	30	3A	Pyrethroid
Danitol	+++	21.3 oz	2	3	10	21.3 oz	2	14	10	3A	Pyrethroid
Dimate	+++	1 lb	1	28	N/A	1 lb	1	28	N/A	1B	Organophosphate
Endigo ZC	++++	5.5 oz	19 oz	14	7	6 oz	28 oz	35	10	3A	Pyrethroid + Neonicotinoid

Materials and Ratings Effective for BMSB

Product Name	BMSB Rating	Peach				Pome fruit				IRAC	Class
		Rate	Seasonal No. apps or material	PHI	Interval (days)	Rate	Seasonal No. apps or material	PHI	Interval (days)		
Lambda-Cy	++	5.12 oz	25.6 oz 20.48 oz post bloom	14	5	5.12 oz	25.6 oz 20.48 oz post bloom	21	5	3A	Pyrethroid
Lannate SP	++	1 lb	6	4***	7	1 lb	5	14	7	1A	Carbamate
Leverage 2.7	+++	4.4	10.2 oz	7	14	4.4 oz	5.1 oz	7	14	4A + 3A	Neonicotinoid + Pyrethroid
M-Pede	++	2% v/v	3 sequential apps		7	2% v/v	3 sequential apps		7		Potassium salt
Mustang Max	+++	4 oz	24 oz	14	7	4 oz	24 oz	14	7	3A	Pyrethroid
Pyganic 1.4 EC	++	16 oz	N/A	0.5	N/A	16 oz	N/A	0.5	N/A		Pyrethrin
Scorpion	+++	7 oz	10.5 oz	3	7	N/A	N/A	N/A	N/A	4A	Neonicotinoid
Surround	++	25-50 lb	N/A	1	7	25-50 lb	N/A	1	7		Particle film
Venom	+++	4 oz	8 oz	3	7	N/A	N/A	N/A	N/A	4A	Neonicotinoid
Voliam Flexi	+++	7 oz	14 oz	14	10	7 oz	16 oz	35	10	4A + 28	Neonicotinoid + Diamide
Voliam Xpress	+++	12 oz.	31 oz	14	7	12 oz	31 oz.	21	10	3A + 28	Pyrethroid + Diamide
Warrior II	+++	2.56 oz	12.8 oz, 10.24 oz post bloom	14	5	2.56 oz	12.8 oz, 10.24 oz post bloom	21	5	3A	Pyrethroid

New Products

Apta -tolfenpyrad (21A)

Nichino

Similar to Nexter MOA

Toxic to bees

15% liquid

Contact and ingestion

All life stage and anti-feeding

Stone Fruit

Aphids

Plum Curculio

Leafrollers

PHI - 14D

REI - 12 hr

Sivanto - flupyradifurone (4D)

Bayer

Similar to Neonicotinoids

200 SL 1.67 lb ai/gal

Ingestion

Systemic (depending on appl.)

Pome fruit, small fruit

Aphids

Scale

Pear Psylla

PHI - 14D

REI - 4 hr

Most Likely Pests, Days After Full Bloom

Pest	7-15
Tarnished Plant Bug	
Plum Curculio	
Oriental Fruit Moth	
Green Peach Aphid	

Actara - PC, TPB, GPA

Voliam Flexi - PC, OFM, TPB, GPA

Avaunt - PC, OFM

Belay - PC, TPB, GPA

Imidan - PC, TPB, OFM

Gray = Maybe it's present

Green = Effective on BMSB

Save the Pyrethroids and other "hot" BMSB materials

Most Likely Pests, Days After Full Bloom

Pest	15-30
Tarnished Plant Bug	
Plum Curculio	
Oriental Fruit Moth	
Green Peach Aphid	
Stink Bugs native	
BMSB	

Actara - PC, TPB, GPA

Voliam Flexi - PC, OFM, TPB, GPA

Avaunt - PC, OFM

Belay - PC, TPB, GPA

Imidan - PC, TPB, OFM

Gray = Maybe it's present

Green = Effective on BMSB

Alternate w/ a material used previously

Save the Pyrethroids and other "hot" BMSB materials

Most Likely Pests, Days After Full Bloom

Pest	30-45
Tarnished Plant Bug	
Plum Curculio	
Oriental Fruit Moth	
Green Peach Aphid	
Stink Bugs native	
BMSB	
Scales	
Flower Thrips	
Tufted Apple Budmoth	
European Red Mite	
Two Spotted Spider Mite	
Japanese Beetle	
Lesser Peachtree Borer	

Actara -TPB, SB, BMSB

Voliam Flexi -TPB, SB, BMSB

Belay -TPB, SB, BMSB

Imidan -TPB,SB

Perm-up -TPB, SB, BMSB

Endigo -TPB, SB, BMSB

Mustang Max -TPB, SB, BMSB

Warrior -TPB, SB, BMSB

No pest is a sure thing here.
Needs to be scouted.

Most Likely Pests, Days After Full Bloom

Pest	45-60
Tarnished Plant Bug	
Plum Curculio	
Oriental Fruit Moth	
Green Peach Aphid	
Stink Bugs native	
BMSB	
Scales	
Flower Thrips	
Tufted Apple Budmoth	
European Red Mite	Action Threshold
Two Spotted Spider Mite	
Japanese Beetle	
Lesser Peachtree Borer	
Peachtree Borer	

Actara -TPB, SB, BMSB

Voliam Flexi - OFM,TPB, SB, BMSB, TBM

Belay -TPB, SB, BMSB (watch PHI)

Imidan -OFM, TPB, SB

Perm-up -OFM,TPB, SB, BMSB, TBM

Endigo -OFM,TPB, SB, BMSB, TBM

Mustang Max -OFMTPB, SB, BMSB, TBM

Warrior -OFM,TPB, SB, BMSB, TBM

Brigade/Bifenture - OFM, SB, BMSB, TBM

TPB will be present with flowering weeds.

Most Likely Pests, Days After Full Bloom

Pest	60-75
Tarnished Plant Bug	
Plum Curculio	
Oriental Fruit Moth	
Green Peach Aphid	
Stink Bugs native	
BMSB	
Scales	
Flower Thrips	
Tufted Apple Budmoth	
European Red Mite	Action Threshold
Two Spotted Spider Mite	
Japanese Beetle	
Lesser Peachtree Borer	
Peachtree Borer	

Voliam Flexi - OFM, SB, BMSB, TBM
 Voliam Xpress - OFM, SB, BMSB, TBM
 Imidan -OFM, SB
 Perm-up -OFM,SB, BMSB, TBM
 Endigo -OFM,SB, BMSB, TBM
 Mustang Max -OFM,TPB, SB, BMSB, TBM
 Warrior -OFM,TPB, SB, BMSB, TBM
 Brigade/Bifenture - OFM, SB, BMSB, TBM

TPB will be present with flowering weeds.

Most Likely Pests, Days After Full Bloom

Pest	75-90
Tarnished Plant Bug	
Plum Curculio	
Oriental Fruit Moth	
Green Peach Aphid	
Stink Bugs native	
BMSB	
Scales	
Flower Thrips	
Tufted Apple Budmoth	
European Red Mite	Action Threshold
Two Spotted Spider Mite	
Japanese Beetle	
Lesser Peachtree Borer	
Peachtree Borer	

Voliam Flexi -SB, BMSB, TBM
 Voliam Xpress -SB, BMSB, TBM, JB
 Imidan -SB, JB
 Perm-up -SB, BMSB, TBM, JB
 Endigo -SB, BMSB, TBM, JB
 Mustang Max -TPB, SB, BMSB, TBM, JB
 Warrior -TPB, SB, BMSB, TBM, JB
 Brigade/Bifenture -SB, BMSB, TBM, JB
 Danitol -SB, BMSB, TBM, JB
 Baythroid - SB, BMSB, TBM, JB
 Lannate - SB, BMSB, TBM, JB
 Venom/Scorpion - SB, BMSB

TPB will be present with flowering weeds.
 Venom & Scorpion - preharvest for BMSB
 Scales- target crawlers
 Favor Danitol, Baythroid, Leverage, Lannate,
 Scorpion and Venom for PHI's
 Delegate for thrips & Leps

Most Likely Pests, Days After Full Bloom

Pest	90-105
Tarnished Plant Bug	
Plum Curculio	
Oriental Fruit Moth	
Green Peach Aphid	
Stink Bugs native	
BMSB	
Scales	
Flower Thrips	
Tufted Apple Budmoth	
European Red Mite	Action Threshold
Two Spotted Spider Mite	
Japanese Beetle	
Lesser Peachtree Borer	
Peachtree Borer	

Voliam Flexi -OFM,SB, BMSB, TBM

Voliam Xpress -OFM, SB, BMSB, TBM, JB

Imidan -OFM, SB, JB

Perm-up -OFM, SB, BMSB, TBM, JB

Endigo -OFM, SB, BMSB, TBM,JB

Mustang Max -OFM, TPB, SB, BMSB, TBM, JB

Warrior -OFM, TPB, SB, BMSB, TBM, JB

Brigade/Bifenture -OFM, SB, BMSB, TBM, JB

Danitol -OFM, SB, BMSB, TBM, JB

Baythroid - OFM, SB, BMSB, TBM, JB

Lannate - OFM, SB, BMSB, TBM, JB

Venom/Scorpion - SB, BMSB

TPB will be present with flowering weeds.

Venom & Scorpion - preharvest for BMSB

Scales- target crawlers

Favor Danitol, Baythroid, Leverage, Lannate,

Scorpion and Venom for PHI's

Delegate for thrips and Leps

Most Likely Pests, Days After Full Bloom

Pest	105-120
Tarnished Plant Bug	
Plum Curculio	
Oriental Fruit Moth	
Green Peach Aphid	
Stink Bugs native	
BMSB	
Scales	
Flower Thrips	
Tufted Apple Budmoth	
European Red Mite	Action Threshold
Two Spotted Spider Mite	
Japanese Beetle	
Lesser Peachtree Borer	
Peachtree Borer	

Danitol -OFM, SB, BMSB, TBM
 Baythroid - OFM, SB, BMSB, TBM
 Leverage - OFM, SB, BMSB, TBM
 Lannate - OFM, SB, BMSB, TBM
 Venom/Scorpion - SB, BMSB

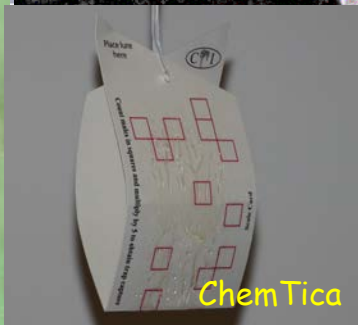
TPB will be present with flowering weeds.
 Venom & Scorpion - preharvest for BMSB
 Scales- target crawlers
 Favor Danitol, Baythroid, Leverage, Lannate,
 Scorpion and Venom for PHI's
 Delegate for thrips and Leps

The Other Insects

Scales and Borers

San Jose Scale

- 2-3 generations per year.
- Overwinter as immature and mature in early spring.
- Males emerge and mate late April early May.
- Live birth.
- 1st generation crawlers in early June~4wks.
- Mature adults by late July.
- 2nd generation adults by mid July.
- 3rd generation adults late October.
- Life cycle takes about 5 weeks.
- Each female can produce 300-400 offspring.
- Crawlers move around before settling and dev. waxy layer
- Adult males can fly, females do not.
- Monitor males or crawlers.



If you had scale in 2014:
Use Oil 3-4 gal DD plus Esteem or Centaur

If you miss this then monitor the crawlers
Esteem 35WP - 4-5 oz/A

or

Centaur - 34.5 oz/A

or

Movento - 6-9 oz/A (combine w/ adjuvant)





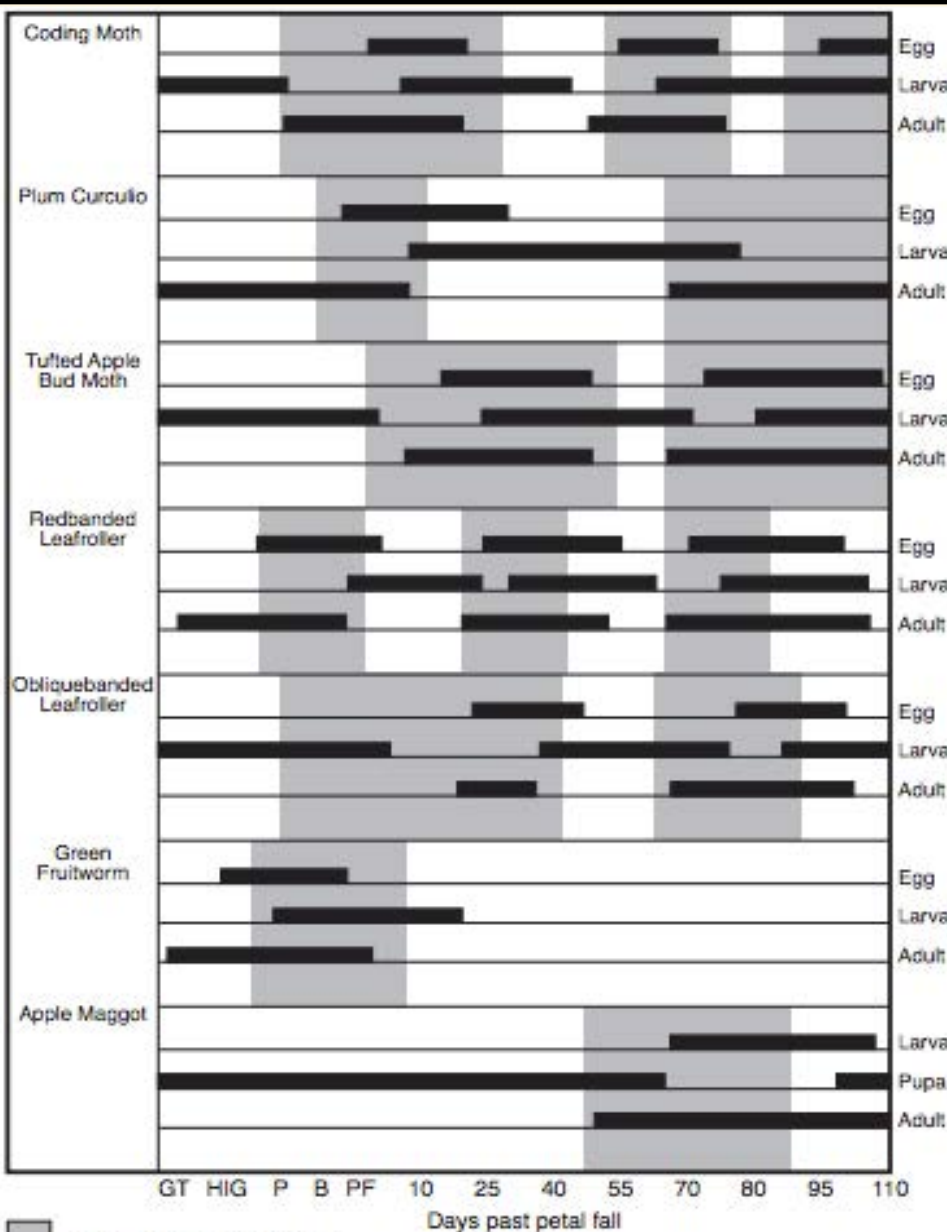
Lesser Peachtree and Peachtree Borers (LPTB) (PTB)

- LPTB - 2 generations
- Treat when eggs are being deposited.
- Use a handgun dilute but nobody can afford this,
- So just make sure the pyrethroids used for BMSB have good coverage (mid June-mid July).
- Treat the 2nd generation the same time as treating PTB.

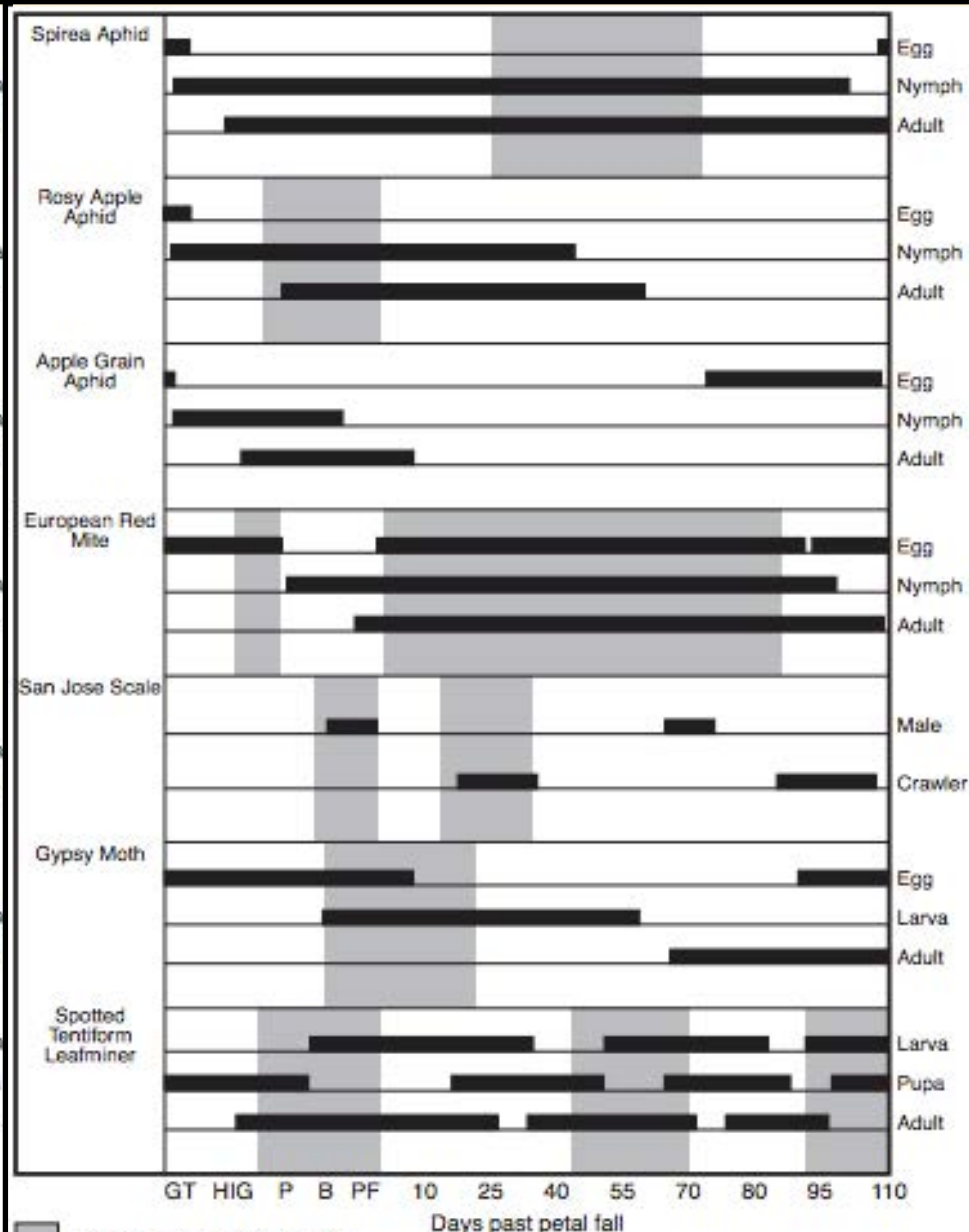
- PTB - 1 generation
- Treat as eggs are being laid and larvae are hatching or have just emerged and still young.
- Saturate the bottom of the tree so chemical reaches young larvae or fumes to where they are.
- Treat as soon as possible immediately after harvest ~ Labor Day
- Lorsban 4E 1.5 qt/100 gal

Programs for Apples





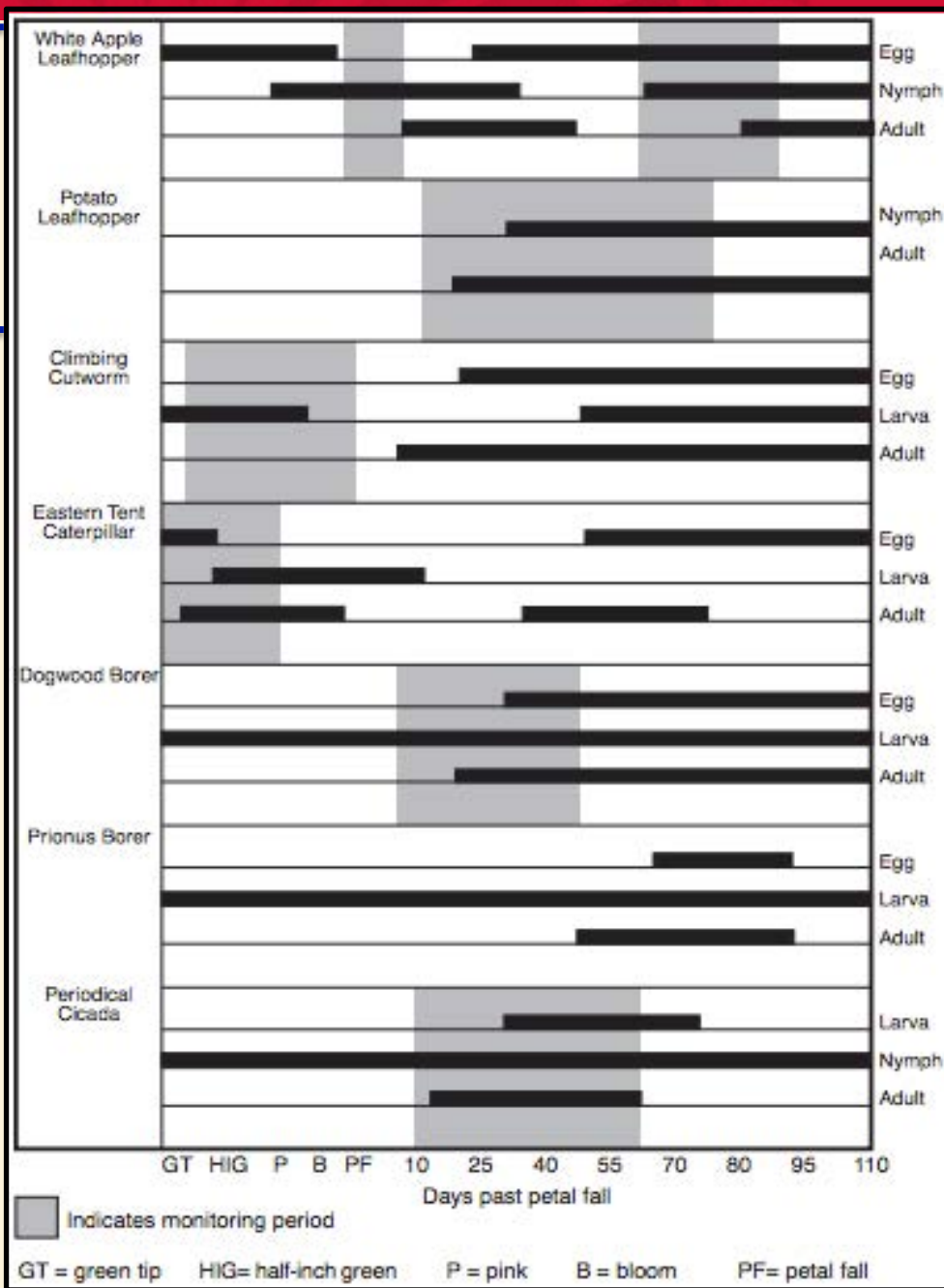
Indicates monitoring period
 GT = green tip HIG = half-inch green P = pink B = bloom PF = petal fall



Indicates monitoring period
 GT = green tip HIG = half-inch green P = pink B = bloom PF = petal fall

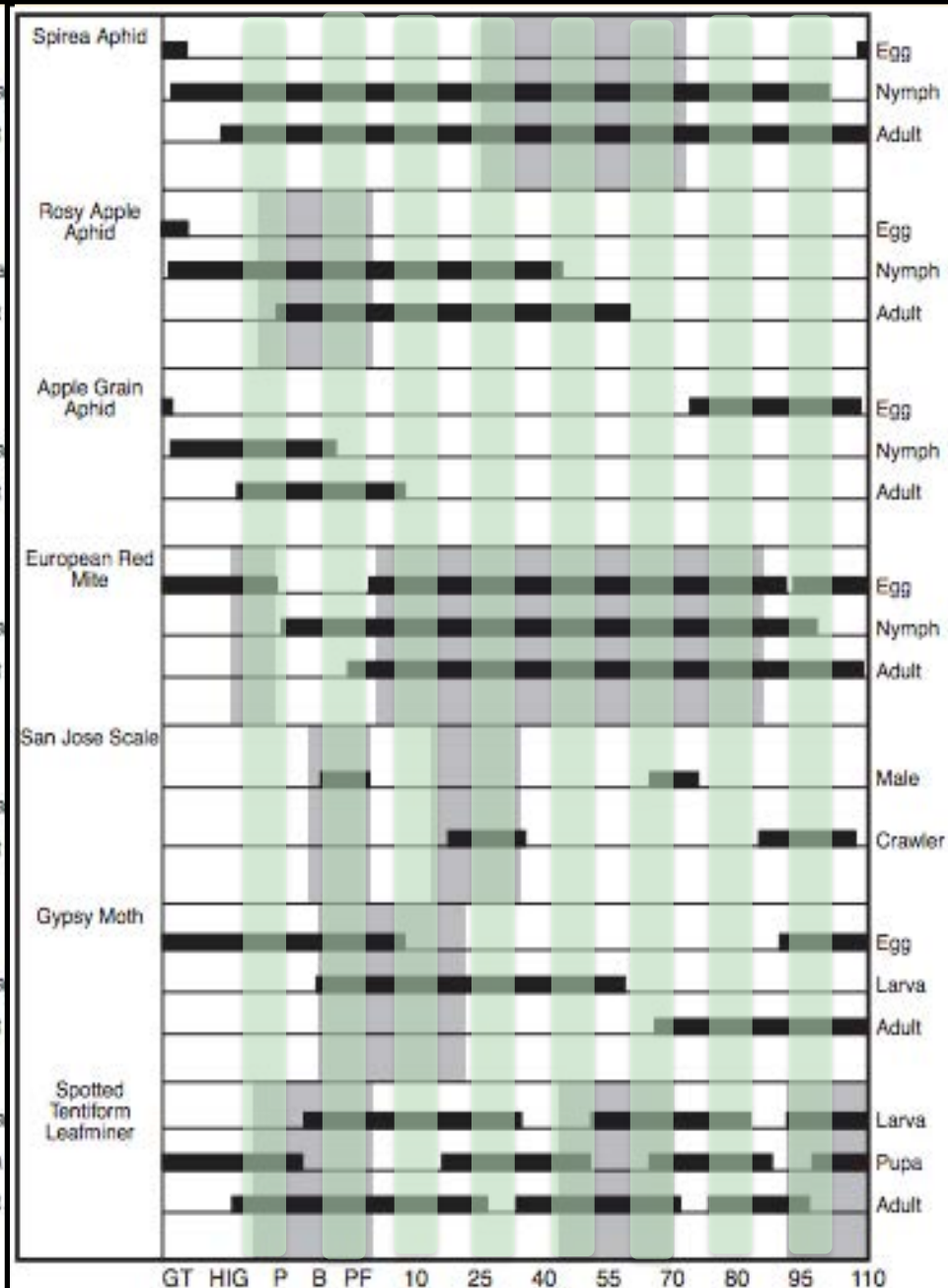
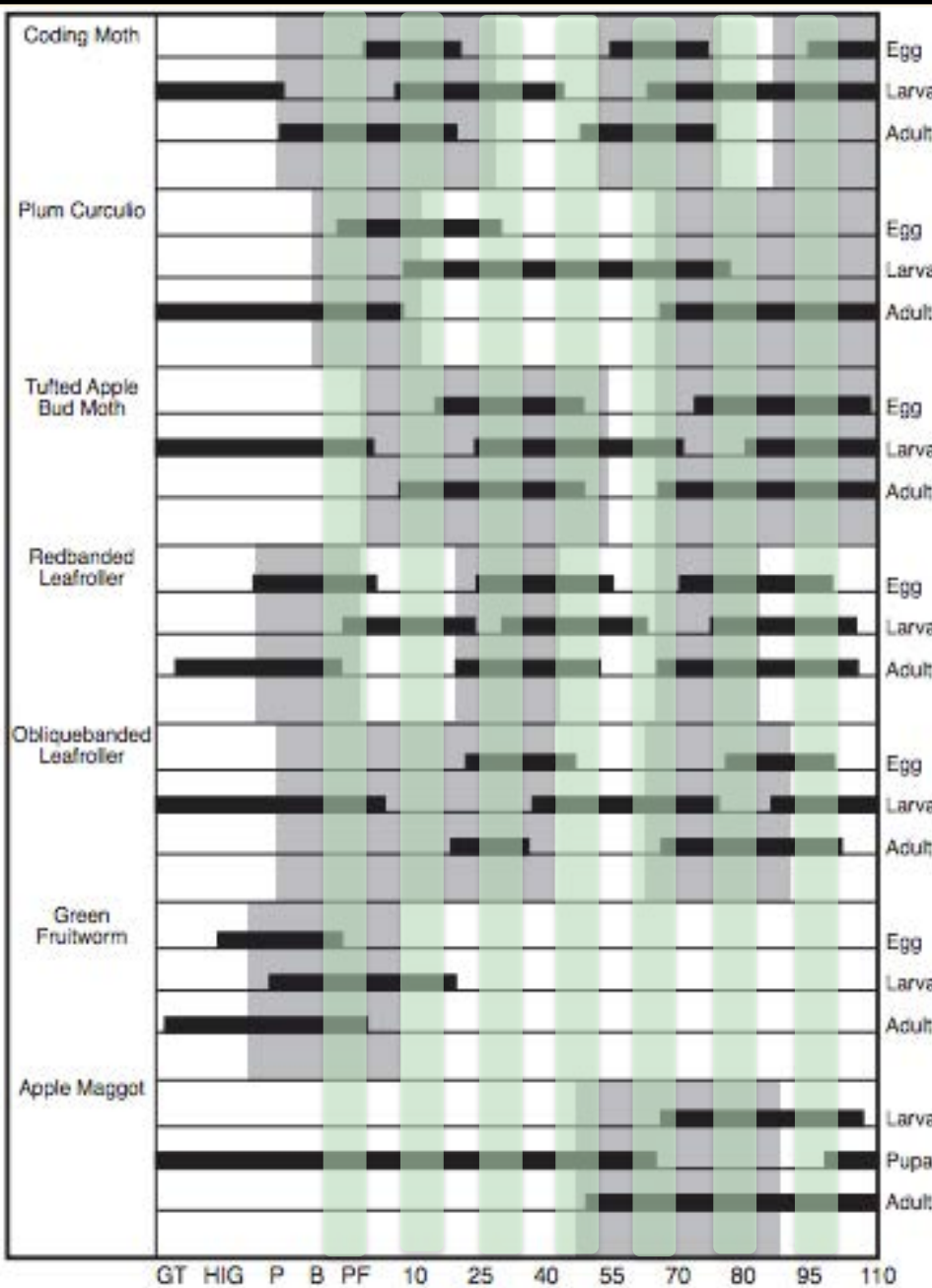
Hardly Ever

Mid June



Add BMSB 10 days after PF to harvest.

Provisional threshold of 10/ trap.



HG-P

Apple/Spirea Aphid complex

Rosy Apple Aphid

Red Mites

European Apple Sawfly

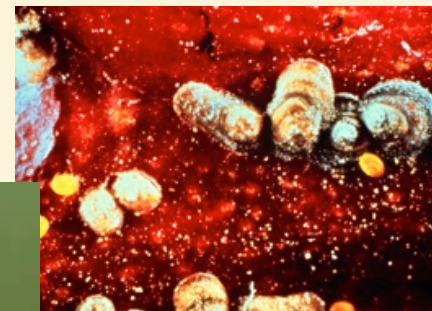
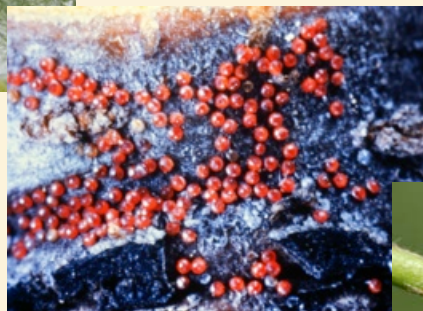
Scale

Oil +

Assail

Actara

Calypso

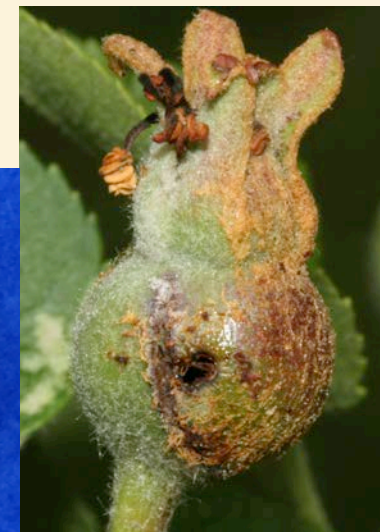


PF

Plum Curculio
European Apple Sawfly
Oriental Fruit Moth
Redbanded Leafroller
Green Fruitworm
Tarnished Plant Bug
(BMSB)?

Imidan
Avaunt
Calypso
Assail +

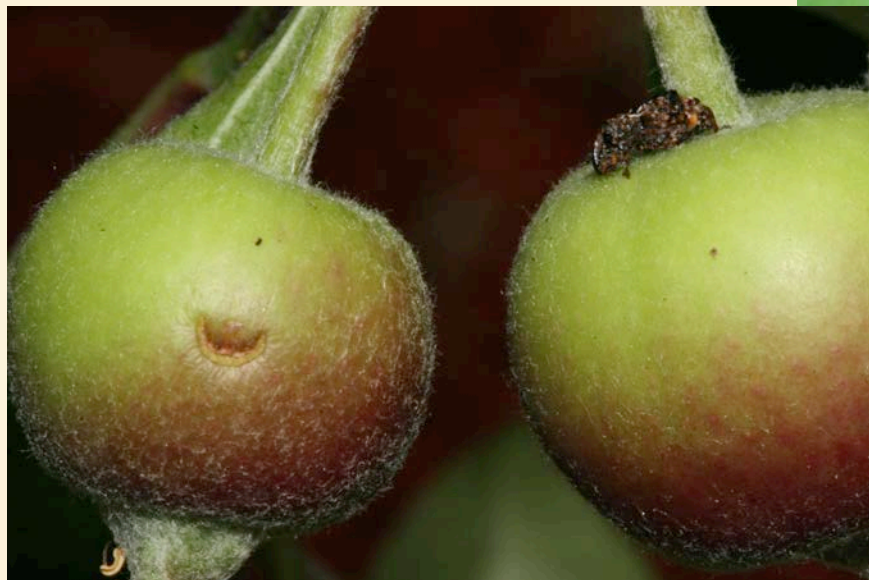
Imidan or Avaunt if BMSB
*Include a neonic if aphids
not yet controlled



1st C

Plum Curculio
Codling Moth
STLM?
Aphids?
(BMSB?)

Voliam Flexi (Altacor+Actara)
Avaunt+ Actara or Belay
Imidan+ Actara or Belay



2nd C

Codling Moth

Tufted Apple Budmoth?

Plum Curculio?

(BMSB)?

Voliam Flexi

Endigo (Lcy+Actara)

Leverage (Baythroid+Actara)

Delegate + Actara or Belay

Belt or Turismo+

Actara or Belay



3rd C (about mid June

Not much going on

Apple Maggot?

Tufted Apple Budmoth?

Oriental Fruit Moth?

San Jose Scale?

(BMSB)?

Any pyrethroid

Baythroid

Danitol

Warrior

Premixes -

Leverage

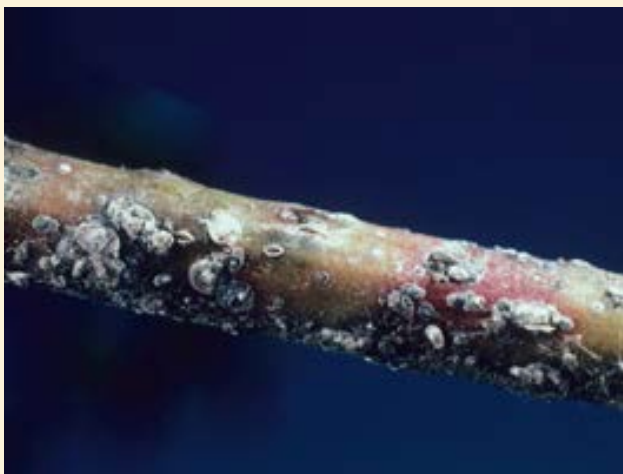
Endigo

Scale-

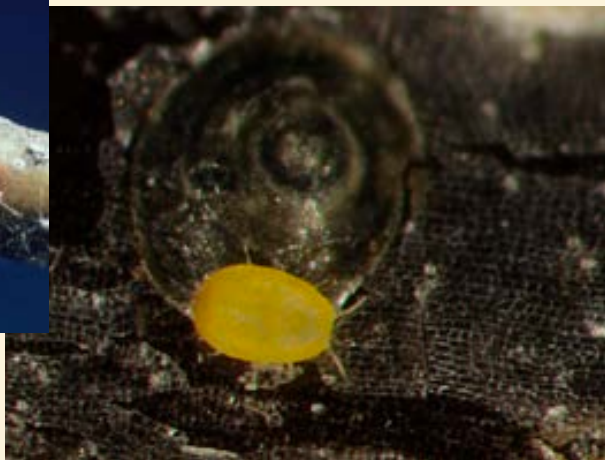
Esteem

Centaur

Movento



WSU E. Beers



4th C

Codling Moth
Apple Maggot?
STLM?
(BMSB)



Delegate +
A pyrethroid -
Baythroid
Danitol
Mustang Max
Warrior



Pyrethroids alone

Consider border sprays of BMSB materials -
Pyrethroids incl. Brigade/Bifenture (sec 18),
Lannate, Venom/Scorpion

5th C

Codling Moth

Tufted Apple Budmoth?

Obliquebanded LR

STLM?

Apple Maggot?

(BMSB)

Delegate +

A pyrethroid -

Baythroid

Danitol

Mustang Max

Warrior

Pyrethroids alone

Consider border sprays of BMSB materials -
Pyrethroids incl. Brigade/Bifenture (sec 18),
Lannate, Venom/Scorpion

6th C

Tufted Apple Budmoth?
Codling Moth?
Apple Maggot?
(BMSB)



A pyrethroid -
Baythroid
Danitol
Mustang Max
Warrior or
Lannate

Frequent
applications
especially to border

Final Words on BMSB



Get some pyramid traps. A conservative threshold is 1 - 10 BMSB per trap.(10 has worked in research trials in apples). When BMSB are present then 7 day border treatments help - This lets you stretch everything else, even if not using MD.

Border spray every 7 days, ground cover w/ Stinger or Spur 4 oz/A, MD in peach.



Thank You