



## Vermont Apple IPM News

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May 18, 2006

**Stage of Development:** *Petals are falling in the rain...*

2006 Reports of Apple Bud Stage (McIntosh) for Selected Sites				
Date	UVM HRC South Burlington Chittenden Co. Elev. 71 M	Shoreham Addison Co. Elev. 107 M	South Hero Grand Isle Co. Elev. 54M	Dummerston Windham Co. Elev. 171 M
4/01	Dormant / Slight Swelling	Dormant Silver Tip (4/05)	Dormant	Early Silver Tip
4/10	Silver Tip		Silver Tip	Green Tip (4/13)
4/17	Green Tip (GT) 4/13 Half-Inch Green (HIG) 4/19	GT 4/13 HIG 4/19	GT 4/14	GT 4/13 1/4" GT 4/17
4/24	Early Tight Cluster (TC)	TC 4/27	HIG 4/19	Early Tight Cluster (TC)
5/01	TC 4/27	Pink 5/04	TC	Pink 4/29
5/08	Pink 5/05 King Bloom 5/08 Full Bloom 5/10	King Bloom 5/05 Full Bloom 5/06	Pink 5/06 First Bloom 5/11	King Bloom 5/06 Full Bloom 5/08
5/15		Petal Fall (PF) 5/13	Full Bloom 5/15	

### Disease Management Update

***“Rain, rain go away, come back again some other day...”***

**Fire Blight** — Using Skybit E-Weather data at the above locations, as of May 14th, all four conditions necessary for infection had not been met according to the MARYBLYT™ fire blight model. Using weather predictions through May 20th, again, the model predicted that conditions for infection would not be met. Basically, the model indicates that temperatures have been too cool for the bacterial population to build up to threshold levels. However, the population can build up quickly in warm weather so, in areas of the state that will still be in bloom when the weather turns warm — be on the alert for whether the four conditions listed in the last issue of this newsletter are met and take appropriate action.

## 2006 Degree Day Accumulation for Apple Scab Ascospore Maturity

2006 <b>Estimated Degree-Day</b> Accumulation (Base 32F, from McIntosh Green Tip) for Selected Sites				
	UVM HRC South Burlington Chittenden Co. Elev. 71 M	Shoreham Addison Co. Elev. 107 M	South Hero Grand Isle Co. Elev. 54M	Dummerston Windham Co. Elev. 171 M
Date	04/13 (GT)	04/13 (GT)	04/13 (GT)	04/14(GT)
5/13	594	597	582	607
5/16	665	662	656	660

**Apple Scab** - We are approaching the end of the “accelerated phase” of ascospore maturity (i.e., 700 DD), but, we are still currently in a high risk phase albeit the tail end. Please remember that even when we reach the “final phase” of ascospore maturity, you should not lower your guard. A conservative estimate of the final scab ascospore release is when 900 DD have accumulated and there is a daytime rain of at least 0.1 inch and temperatures of at least 50F during the wetting period.

How to keep your trees protected with all this rain? Good question. Sulfur, captan, and mancozeb fungicides applied in the rain should provide some protection, i.e., at most 3-4 days of protection. Full label rates would be advisable. Fungicides such as Sovran, Flint, Vanguard, Scala, Topsin M, and the SI fungicides should not be applied in the rain since these fungicides must dry on the leaf to be effective.

If you need “post-infection” activity (and who does not this week !), the SI fungicides would have the *potential* for greater “kick-back” (i.e., 72-96 hours) than the strobilurin fungicides (i.e., 48-72 hours) IF the scab population in your orchard is not resistant to SI fungicides. Also, if the scab population is resistant to SI fungicides, the “post-infection” activity of the strobilurin fungicides may only be 48 hours. I know - - this is not good news. In any case, you may want to consider using a full rate of captan with the SI fungicide or strobilurin as a hedge against the uncertainty of resistance in your orchard and to help in suppression of conidia if scab lesions are already present. The picture of a primary scab lesion shown below was taken this week on a non-sprayed McIntosh tree at the UVM Hort. Res. Center.



Small primary scab lesion at tip of leaf.

## 2006 Degree Day Accumulation for Arthropod Pests

2006 <b>Estimated</b> Degree-Day Accumulation (Base 50F, from Jan. 1) for Selected Sites				
Date	UVM HRC South Burlington Chittenden Co. Elev. 71 M	Shoreham Addison Co. Elev. 107 M	South Hero Grand Isle Co. Elev. 54M	Dummerston Windham Co. Elev. 171 M
5/13	187	186	185	202
5/16	204	197	205	205

Degree Day and other weather information received from Skybit E-Weather Service: <http://www.skybit.com/>

### ***Arthropod Management Update***

**Green Pug Moth**— Feeding damage by Green Pug Moth larvae is very evident on non-sprayed trees at the UVM Hort. Research Center (UVM HRC) this spring (see pictures below). I suspect more damage occurred this year because blossom development was slow giving the insect more time for feeding. This insect is usually managed by pre-bloom insecticides. Not only did we see the insect on mature trees, the larvae caused damage on developing buds of top-grafted scion wood — which is more of a concern. There is only one generation per year so, hopefully, the peak period of damage has past.



GPM larva (in square) and damage to leaves



GPM larval damage to developing blossoms

**Leafminers**— Very early sap-feeding mines were observed on the underside of leaves this week (between the raindrops!). The following are the thresholds for 1st generation LM sap-feeding mines: McIntosh: 7 mines per 100 leaves; Non-McIntosh: 14 mines/100 leaves.

**European Apple Sawfly**— Trap captures on white rectangular visual traps have been relatively low at the UVM HRC. As of May 15th, the cumulative trap capture was only 1.5 adults in managed blocks and 7.3 adults in non-sprayed blocks. Thresholds at Petal Fall are: 9/trap in blocks that received a pre-bloom insecticide; 5/trap in blocks that did not receive a pre-bloom insecticide.

**Codling Moth** — We have just started to capture CM in pheromone traps at the UVM HRC. First trap capture was on May 17th. We will monitor degree-day accumulation to identify the optimal period for management — stay tuned.

## **Round-Up of Petal Fall Arthropods . . .**

The following is a good review written by Dr. Art Agnello for a recent issue of *Scaffolds Fruit Journal* (May 15, 2006) of the insects that will be active at Petal Fall.

### **Plum Curculio**

Adults move into orchards from overwintering sites in hedgerows or the edges of woods and adults are active when temperatures exceed 60F. Adult females oviposit in fruit during both day and night but feed mostly at night. Depending on temperature, overwintering adults remain active for two to six weeks after petal fall. Because adults are not highly mobile, orchards near overwintering sites, woodlands, and hedgerows are most susceptible to attack. Fruit damage is usually most common in border rows next to sites where adults overwinter. Although initial post-bloom sprays for plum curculio control should begin at petal fall, growers are often unsure how many additional sprays will be necessary to maintain protective chemical residues to prevent subsequent damage throughout the PC oviposition cycle, which varies according to temperatures and weather patterns after petal fall.

Following from the fact that PC activity and oviposition are greatly affected by temperature, an oviposition model has been developed to determine when control sprays after petal fall are no longer necessary to protect fruit from PC damage. This model is based on the assumption that residues from control sprays after petal fall only need to be maintained on fruit and foliage until PC adults stop immigrating into orchards, which corresponds with when about 40% of the oviposition cycle is complete. This is predicted by the model to occur at 308 DD (base 50F) after petal fall. Probably, this strategy works because, after 40% of PC oviposition is complete, adults usually are not moving into the orchard from outside sources, or moving around within orchards from tree to tree. Therefore, by this time, adults residing in treated trees have already been killed by insecticide residues and are unable to complete the remainder of their normal oviposition cycle.

In order to use this strategy: (1) Treat the entire orchard at petal fall with a broad spectrum insecticide. (2) Start calculating the accumulation of DD after petal fall (base 50F). (3) No additional sprays are necessary whenever the date of accumulation of 308 DD falls within 10-14 days after a previous spray.

### **European Apple Sawfly**

This primitive bee and wasp relative shows a preference for early or long-blooming varieties with a heavy set of fruit. This insect is generally a pest mainly in eastern N.Y., although it has been slowly making its presence known in the more western sites, progressing even as far as Wayne Co. The adult sawfly emerges about the time apple trees come into bloom and lays eggs in the apple blossoms. Young larvae begin feeding just below the skin of the fruits, creating a spiral path usually around the calyx end. This early larval feeding will persist as a scar that is very visible at harvest. Following this feeding, the larva usually begins tunneling toward the seed cavity of the fruit or an adjacent fruit, which usually causes it to abort. As the larva feeds internally, it enlarges its exit hole, which is made highly conspicuous by a mass of wet, reddish-brown frass. The frass may drip onto adjacent fruits and leaves, giving them an unsightly appearance. The secondary feeding activity of a single sawfly larva can injure all the fruit in a cluster, causing stress on that fruit to abort during the traditional "June drop" period.

Certain insecticides that control these pests also adversely affect bees, which can pose a problem at petal fall because certain apple varieties lose their petals before others. In blocks of trees where petal fall has occurred on one variety but not the others, the variety that has lost its petals is likely to sustain some curculio or sawfly injury until the insecticide is applied. Some recently registered insecticides with activity against both plum curculio and sawfly -- Calypso, Avaunt and Actara -- may have a slight advantage over conventional OPs in this case. Calypso is considered safe to honey bees; Avaunt and Actara, although highly toxic to bees exposed to direct treatment, are relatively non-toxic when dried. Another recently registered product, Assail, gives yet another option for controlling sawfly; it's not very active against plum curculio, but will do a good job against rosy apple aphid and spotted tentiform leafminer, as well as sawfly, at this timing. As mentioned in a previous article, Assail can be applied during bloom, which may give it the chance to persist into the period when newly set fruitlets are first susceptible to injury. To minimize the hazard to honey bees, apply any pesticide only when no bees are actively foraging on blooming weeds (evening is better than early morning).

### **Mites**

If you applied oil or a miticide during our ample prebloom mite control window this season, you're in good shape. If not, and you are concerned about early buildup in certain problem blocks, Agri-Mek, Apollo, Savey and Zeal are all appropriate choices to consider at petal fall. Because of the cool temperatures (particularly at night) that can still occur, nymphal

populations are likely to be small enough to be effectively handled by any one of these materials, if they fit into your product rotation schedule (i.e., they weren't used last year).

### **Obliquebanded Leafroller**

Because these insects overwintered as 1st or 2nd stage larvae, they probably have taken advantage of some of our earlier warm weather to feed and grow into good-sized caterpillars, although I have to say that they haven't been especially numerous or sizeable up to this point. It would be prudent to have a quick look for late-stage larvae in problem blocks to determine whether a treatment against the overwintered brood should be included in your petal fall plans. Scout the blossom clusters for larvae feeding within both the flowers and rolled leaves; a 3% infestation rate could justify an application to minimize overwintered fruit damage and help reduce summer populations. Among the selective insecticides available, Intrepid has been successful at this timing, and B.t. products, which can be used while blossoms are still present, include Dipel, Deliver, Agree and Javelin. Pyrethroids such as Asana, Danitol, Warrior or Proaxis can also be effective, depending on past use history, but be aware of their broad-spectrum effects, which can work both for and against you, according to how many beneficial mites and insects you can afford to lose. Another new/old product to consider this year is Lorsban 75WG, which had been the last of the 'unconventional' OPs to retain efficacy against OBLR when it was available for summer use. Now that it is registered for use in apples (and tart cherries) at petal fall, populations may be susceptible to this a.i. as a good rotational option.

### **White Apple Leafhopper**

We haven't spotted any yet, but WALH nymphs can be numerous in some blocks at petal fall, especially in the eastern part of the state. Nymphal populations of 1 or more per leaf can result in stippling damage to the leaves. Provado, Actara, Avaunt, Assail and Calypso have proven to be effective against this pest, and a petal fall application of any of these materials also gives leafminer control. Rosy apple aphids can similarly be cleaned up with this strategy (for all of the above except Avaunt), although petal fall is often too late to prevent fruit damage that their feeding may have caused. Growers using Sevin in their thinning sprays will get some WALH control at the 1 lb rate. Alternative choices include Thionex and Lannate; Agri-Mek or Carzol used for mites now will also do the job, although Carzol will be harmful to predator mites.

***Thank you Dr. Agnello for that review !***

## **Arthropod Activity to “Expect” based on Degree Days:**

<b>Arthropod ‘Events’ Based on Degree-Day Accumulation<sup>1</sup></b>	
<b>Pest Event</b>	<b>Estimated DD Base 50 F for Event (from Jan 1)</b>
STLM -1st sap-feeding mines observed	165-317
San Jose Scale (SJS) - 1st adult catch	186-324
Plum Curculio (PC) - 1st oviposition scars observed	249-323

<sup>1</sup> Source of Estimated DD (Base 50F) for arthropod pest events: 2006 Pest Management Guidelines for Commercial Tree-Fruit Production. A Cornell Cooperative Extension Publication; Table 14: "Degree-day accumulations (from January 1) corresponding to selected fruit phenology and arthropod pest events." <http://www.nysaes.cornell.edu/ent/treefruit/>

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