



Vermont Apple IPM News

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Stage of Development:

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	GT 4/13	GT 4/14	GT 4/13 1/4" GT 4/17

IPM Tool — Tracking Degree Days

As in previous years, we are tracking degree day accumulation at locations in the state using *Skybit E-Weather Service*. Charts for ascospore maturity and degree day accumulation for arthropod activity will be updated weekly (usually on Monday) and posted on:

<http://orchard.uvm.edu/uvmapple/pest/index.html>

As you see above, we also will be reporting stage of development of McIntosh buds at four sites around Vermont.

2006 Degree Day Accumulation for Apple Scab Ascospore Maturity

2006 Estimated Degree-Day 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)
4/15	60	65	40	74

Disease Management Update

Apple Scab - - With the return of warmer weather this week, it is predicted that by Saturday, April 22, the above locations will have accumulated between 173—195 DD. This means that the estimated ascospore maturity will be around 12%. It is also predicted that rains will arrive on Saturday. In other words, we may have a significant primary infection period this weekend. Suffice to say, susceptible tissue should be well covered with a protective coat of fungicide before the rain arrives. Hopefully, you have completed sanitation practices such as flail mowing overwintering leaves or applying a urea spray on the overwintered leaves to reduce inoculum levels. In my opinion, these practices are valuable in all orchards — those with potentially low or high scab inoculum. However, they are not a replacement for fungicide application.

Dr. Dave Rosenberger recently outlined factors that impact disease management and the vulnerability of high inoculum orchards (Scaffolds Fruit Journal, April 17, 2006). I include them here as a review:

“1. Imperfect spray coverage: Airblast sprayers, even when properly calibrated, cannot provide uniform spray coverage over an entire tree. A small proportion of the surface area of leaves and fruit may receive no fungicide, or the fungicide dose may be so low that it disappears long before the next spray is applied. With low inoculum levels, there is relatively little chance a spore will be lucky enough to land on the small amount of tissue that was not covered by fungicide. As spore numbers rise, however, probabilities increase that some spores will find the unprotected tissue and initiate disease. Consider a Tax Day analogy: Although one tax auditor might fail to discover the unreported income omitted from your tax forms, that omission might be discovered if a group of 100 IRS examiners showed up to audit your tax

returns. Inoculum levels often vary by factors of more than 100, and biological systems can be as unforgiving as the IRS.

2. More infections during short wetting periods: During any wetting period, some spores are released almost immediately and some are released later during the rain period. Some released spores find susceptible host tissue shortly after release, whereas some spores may be blown about for hours before landing. Because of these factors, we know that we can get more disease during longer wetting periods. However, high inoculum levels increase the amount of disease that can develop following short wetting periods. For example, if we hypothesize that one percent of apple scab ascospores are released and find susceptible host tissue immediately after the start of a rain, then a high-inoculum orchard that can release one million spores/A during a 24-hr wetting will have 10,000 spores/A capable of causing infections during the shortest possible Mills infection period, whereas a low-inoculum orchard that can generate only one thousand spores/A in a 24-hr wetting period will be able to generate only 10 infections/A.

3. Reduced fungicide efficacy: Both protectant and post-infection activities of fungicides might be slightly reduced in high-inoculum compared with low-inoculum orchards. Within most fungal populations, individual isolates vary in their susceptibility to fungicides. Usually a small segment of the natural population can survive a considerably higher fungicide dose than the dose that is required to kill 50% of the fungal population. With high inoculum levels, these "outliers" may be present in large enough numbers to create economic losses if there is even the slightest lapse in fungicide protection. Lapses in protection can result from either spray timing or poor coverage, such as occurs when spraying under windy conditions.

4. The three factors noted above can be additive since all three are usually operational at the same time in sprayed orchards. "

Given the situation we have with scab resistance to post-infection fungicides, emphasis should be on good protection of susceptible tissue.

Arthropod Update

2006 Estimated 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
4/01	19	19	17	32
4/08	22	22	20	40
4/15	49	52	46	77

Trap Captures at the UVM HRC

White sticky traps for the **Tarnished Plant Bug (TPB)** were placed in the orchard at Dormant/Silver tip. To date, we have seen little activity — we have caught 10 TPB on 12 traps

Sixteen red sticky traps were placed on tree trunks for **Leafminer (LM)** adults and so far, we have only trapped 1 LM.

The following table is from the *IPM 'Quick' Summary for Monitoring Apple Arthropod Pests* which we pulled together two years ago. The thresholds still apply. It is on the web at:

<http://orchard.uvm.edu/uvmapple/pest/2004IPMQuickSummaryForMonitoring.PDF>

<u>Pest</u>	<u>Phenology</u>		
	<u>Silver Tip</u>	<u>Tight Cluster</u>	<u>Early Pink</u>
			<u>Late Pink</u>
TPB	Place White Sticky Traps	<u>Threshold</u>	
	in Orchard	Wholesale: 3/trap	5/trap
		Retail: 5/trap	8/trap
ABLM	Place red visual traps on south side of tree trunks. Minimum of 4 traps per 8-acre block	McIntosh: 4/trap Non-McIntosh: 8/trap	9/trap 21/trap

The following are some expected arthropod “events” as DD increase:

2006 Guide to Arthropod Pest Events Based on Degree-Day Accumulations¹	
Pest/Phenology Event	Estimated DD Base 50 F (Jan 1)
Redbanded Leafroller (RBLR) - 1st catch	32-124
Rosy Apple Aphid	56-116
Spotted Tentiform Leafminer (STLM) - 1st adult catch	39-113
STLM - 1st egg observed	58-130
Tight Cluster (McIntosh)	84-122
Tarnished Plant Bug (TPB)- 1st observed	43-167
Obliquebanded leafroller (OBLR) - 1st overwintered larvae observed	64-160
European Red Mite (ERM) - egg hatch observed	100-168

¹ 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/>

Thank you for your Support

We recently learned that the grant proposal we had submitted to the USDA Integrated Organic Program was funded !! The title of the project is: “Using ‘New’ Alternatives to Enhance Adoption of Organic Apple Production through Integrated Research, Education, and Extension.” This will be a long-term project and, as the title suggests, it will involve research, extension, and academic education. As you know, apples are an important component of New England’s diversified agriculture and although there is strong interest in organic apple production, there are very few certified organic orchards. This is partly because of insect and horticultural challenges plus disease challenges associated with the

predominant cultivar grown in the New England region (i.e., 'McIntosh'). However, recent shifts in consumer preference to 'newer' cultivars have led to the planting of different apple cultivars which have different disease susceptibility and there are now potential alternatives to insect and horticultural obstacles to organic apple production in the region. Current research knowledge is at a point where it needs to be integrated into organic production systems and evaluated holistically, including an economic analysis of potential economic costs, returns, and risks associated with the systems. Thus, we proposed a multi-disciplinary, multi-state research project which will examine the two major production systems growers would use in changing to new cultivars and to organic production. At the UVM Horticulture Research Center, we will be planting a new orchard from nursery trees and have already top-grafted an established orchard. Both orchards will be grown with organic methods. The cultivars in both orchards include: Honeycrisp, Zestar!, Macoun, Ginger Gold, and Liberty. These orchards will be used for both research, demonstration, and education.

There are many facets to the project and as time goes on, you will be hearing about them. Technically, the project has not officially started but we are going "full-steam" ahead with planting/grafting the orchards. As mentioned above, the project is multi-disciplinary and involves other states. The following are presently the other members of the project:

University Faculty:

- ◆ Elena Garcia, University of Arkansas
- ◆ Renae Moran, University of Maine
- ◆ Heather Darby, University of Vermont
- ◆ Robert Parsons, University of Vermont
- ◆ John Hayden, University of Vermont

Technical Team:

- ◆ Terry Bradshaw
- ◆ Sarah Kingsley-Richards

Plus - -

- ◆ Growers in Vermont and Maine

We want to sincerely thank everyone who endorsed the project through letters of support and encouragement !! They were very important in the decision to fund the project.

We also want to extend a special "thank you" to the members of the Vermont Tree Fruit Growers' Association for your continued research support !

Thank you !!

Contact Information

A Commitment to Excellence and Service:

If you have any questions or want to arrange for an orchard visit regarding your concerns, please call or write.

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