

**2013 Vermont Apple Season Highlights**  
**Persons Reporting: Terence Bradshaw, Lorraine Berkett, Ann Hazelrigg,**  
**Sarah Kingsley-Richards, Zachary Noel.**

2013 Apple Bud Stage for Selected Cultivars									
Dates posted represent timing when 50% of fruit buds on representative trees had reached the selected bud stage. Weather data are collected with an on-site automated Rainwise MK-III SP1-LR Weather Station (Bar Harbor, ME), connected to the <a href="#">NEWA weather network</a> .									
Cultivar	Orchard	Silver Tip	Green Tip	Half Inch Green	Tight Cluster	Pink	First Bloom	Full Bloom	95% Petal Fall
Ginger Gold	Org 1	4/7	4/18	4/23	4/28	5/1	5/5	5/7	5/12
Honeycrisp	Org 1	4/16	4/19	4/26	4/29	5/5	5/8	5/9	5/17
Liberty	Org 1	4/16	4/20	4/25	4/29	5/3	5/6	5/8	5/16
Macoun	Org 1	4/8	4/20	4/28	4/30	5/5	5/8	5/9	5/17
Zestar	Org 1	4/6	4/18	4/20	4/28	5/2	5/5	5/7	5/12
Ginger Gold	Org 2	4/7	4/18	4/23	4/28	5/1	5/6	5/7	5/12
Honeycrisp	Org 2	4/16	4/20	4/28	4/30	5/5	5/7	5/9	5/17
Liberty	Org 2	4/16	4/20	4/24	4/29	5/3	5/6	5/7	5/16
Macoun	Org 2	4/8	4/20	4/28	4/30	5/5	5/8	5/9	5/17
Zestar	Org 2	4/7	4/17	4/20	4/28	5/2	5/5	5/7	5/12
Crimson Crisp	Org 4	4/14	4/17	4/27	4/30	5/4	5/8	5/9	5/17
Crimson Gold	Org 4	4/7	4/20	4/27	4/29	5/1	5/8	5/9	5/17
Crimson Topaz	Org 4	4/16	4/20	4/27	4/29	5/3	5/6	5/8	5/15
Galarina	Org 4	4/5	4/19	4/24	4/29	5/4	5/7	5/9	5/17
Florina Querina	Org 4	4/5	4/20	4/27	4/30	5/4	5/8	5/10	5/18
Williams Pride	Org 4	4/7	4/19	4/23	4/28	5/1	5/6	5/7	5/13
Winecrisp	Org 4	4/9	4/18	4/25	4/29	5/1	5/7	5/8	5/14
McIntosh	IPM 20	4/7	4/19	4/25	4/29	5/3	5/6	5/8	5/14
Empire	IPM 20	4/8	4/19	4/24	4/29	5/3	5/6	5/8	5/14
Mutsu	IPM 19	4/7	4/19	4/24	4/28	5/1	5/7	5/8	5/14
Gala	IPM 19	4/8	4/19	4/23	4/28	5/1	5/7	5/8	5/16

**General Weather Conditions** - T. Bradshaw

*weather data collected from Rainwise IP-100 weather station at UVM Horticulture Research Center, South Burlington, VT*

Winter 2012-2013 was relatively mild, with an absolute low of -11°F in January and six days total below 0°F. There was a January thaw which appeared to reduce cold hardiness in grapes but did not affect apples. Spring arrived slowly and steadily, in contrast to 2012 when bud development was three weeks ahead of 'normal' and apple bloom came in the first and second weeks of May. Weather during bloom was nearly perfect for pollination and fertilization in the Champlain Valley, with good

sunshine, low winds, and warm days. Warm weather during full bloom (May 8,9,11) triggered infection conditions for fire blight in apples. A brief, mild frost on May 15 did not appear to affect apples, but killed young growth on grapes near the ground where the temperature was coldest. Beginning the final week of May and continuing through June, rainy weather conditions were the norm, with over nineteen inches of rain measured during May, June, and July at the HRC and more reported in other production areas. By mid-July, precipitation patterns returned to more 'normal' levels. Heat, however, was the weather item of note later in the month, with five days >88°F from July 15-19. August and September were drier, with roughly weekly rainfall of 0.5 – 0.75". Ripening weather has been good, with three nights in the 40s (°F) by September 10, but no killing frost noted in major apple production regions by mid-October.

### **Horticulture Overview** - T. Bradshaw

A below average crop in 2012 and generally mild winter conditions contributed to good potential for an excellent crop this year. For warmer production regions (Connecticut and Champlain valleys), bloom weather was ideal, with little cloud cover, highs in the 70s °F and lows in the 50s°F. Cooler production areas (inland Vermont and Champlain Islands) experienced bloom a few days later, when cooler, rainy weather had set in. Aggressive thinning was required in many Vermont orchards. Excessive moisture was a problem for many growers who had difficulty getting equipment into muddy plantings. Hail was reported in some areas, associated with thunderstorms especially around July 4, but was not widespread in the state. Overall, the Vermont crop is expected to be 5-7% greater than the 5-year normal.

### **Pest Management Overview** - T. Bradshaw, S. Kingsley-Richards, L.P.Berkett, A. Hazelrigg, Z. Noel

**Primary Apple Scab Infection Periods:** 5/8-5/11, 5/19-5/26, 5/29, 6/1-6/2

**Green Tip Date:** 4/19

**Estimated date of 100% Ascospore Maturity (NEWA):** 6/3

Despite few primary infection events this season, **apple scab** was difficult to manage because the later infection events coincided with heavy rainfall that made access into orchards difficult and fungicide residues difficult to maintain.

In a reduced fungicide trial on **Honeycrisp**, **apple scab** incidence and severity were not affected by reducing early-season captan/mancozeb sprays.

**Table 4.** The average percentage of leaves with at least 1 scab lesion (incidence) and the average number of lesions per leaf of leaves sampled (severity) on 'Honeycrisp' in 2012.

Treatment	Dates Sprayed	IP not covered <sup>a</sup>	% Incidence 19 June <sup>b</sup>	% Incidence 7, 8, 9 August	Severity 7, 8, 9 August <sup>c</sup>
NTC=N1	—	1, 2, 3, 4, 5, 6	0.56 <sup>d</sup>	a	0.00
N2	8, 20, 25, 30 April; 7, 14, 21 May	0	0.00	a	0.00
N3	20, 25, 30 April; 7, 14, 21 May	1	0.00	a	0.00
N4	25, 30 April; 7, 14, 21 May	1, 2 (partially not covered)	0.33	a	0.00
N5	30 April; 7, 14, 21 May	1, 2	0.22	a	0.00
N6	7, 14, 21 May	1, 2, 3	0.30	a	0.06

<sup>a</sup>IP=Infection Period and refers to the NEWA infection periods (Table 2).

<sup>b</sup>Incidence values represent the mean percentages of six replications per treatment of five vegetative terminals per replication.

<sup>c</sup>Severity values represent the mean number of lesions per leaf of leaves sampled.

<sup>d</sup>Means followed by the same letters within columns do not have significant F-value, Analysis of Variance,  $P \leq 0.05$

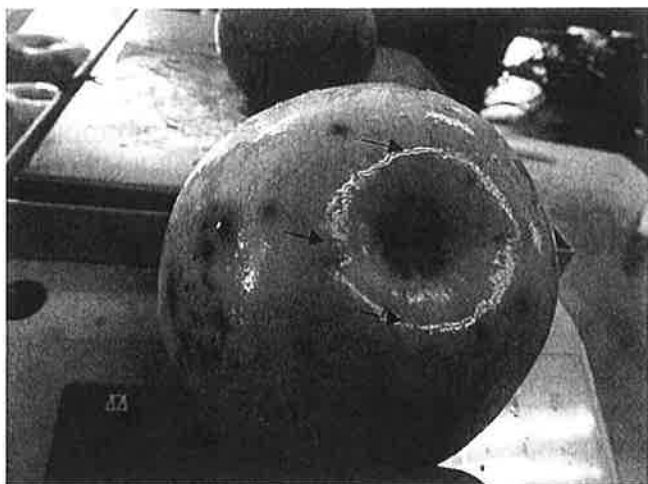
## Fire Blight Infection Periods at UVM HRC:

Based on Maryblyt using the weather data from the Davis weather station on site at HRC for past dates and Skybit forecast data. "High" risk dates in parentheses (). Last Date of Input: 5/31/2013

(5/6), (5/7), **5/8, 5/9**, (5/10), **5/11**, (5/20), (5/21), **5/22, 5/23**

No chemical protective measure were made against fire blight in 2013. Strikes were observed in traditional problem blocks on Gala, Cortland, and Mutsu. In a disease-resistant organic orchard, strikes were observed on several cultivars. Galarina and Crimson Crisp appear to be highly susceptible to the disease, and Crimson Gold, Crimson Topaz, and Florina Querina susceptible. Fire blight strikes were observed on three Ginger Gold trees in OrganicA Orchard 2.

**Brooks Spot** (*Mycosphaerella pomi*) appears to be increasing in organic orchards, with Honeycrisp and Zestar fruit observed most frequently with incidence of the disease.



**Leaf spots** and **general tree decline** were observed in early June on trees in Organic Orchard 1. In some cases, spotting was severe and defoliation occurred.

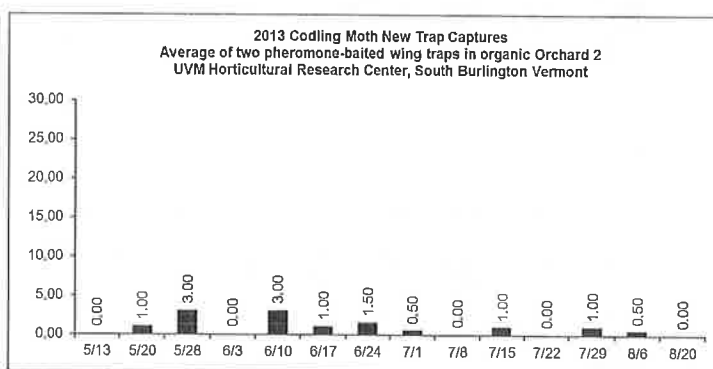
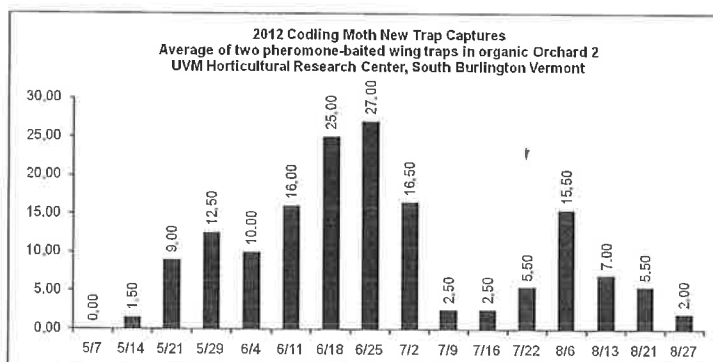


Unidentified fungal fruiting bodies (mushrooms) were observed growing in the mulch under some affected trees:



**Mating Disruption** for codling moth appears to have been very successful in its first season of deployment at the HRC. Concerns that acreage was too fragmented and spread out had stalled its use to date. Dispensers (Isomate TT CM/OFM, Pacific Biocontrol Corp., Vancouver, WA) were placed in OrganicA orchards 1,2, and 4 at a rate of 200 ties per acre. Additionally, ornamental crabapple trees in the organic zone of the farm (~100) received one tie per tree. IPM orchards, isolated by a minimum of 200 yards, were treated with Checkmate Puffer CM (Suterra LLC, Bend OR) at a rate of one puffer per 2.5 acres. Additionally, unmanaged crabapple hedgerows on the property were treated with approximately two puffers per 50-60 meters.

CM flights were greatly reduced from previous years based on weekly wing trap captures. Wing traps were baited with Scentry CM-L104 (Great Lakes IPM, Vestaburg, MI).



Apple damage from internal leps is also greatly reduced:

	Internal Lep Damage to Fruit in Organic Orchard 2 at Harvest (%)		
Cultivar	2011	2012	2013
Ginger Gold	4.7	12.5	2.1
Honeycrisp	9.8	17.3	5.3
Liberty	9.3	11.2	2.4
Macoun	7.1	8.7	1.1
Zestar	9.1	7.9	1.2

CM-targeted sprays:

2012: Eight Cyd-X (CM granulosis virus) + Dipel (Bt), two Entrust (spinosad, targeted at AMF)

2013: Three Cyd-X + Dipel, one Grandevo (Chromobacterium subtsugae), two Entrust (targeted at AMF)

**European Apple Sawfly** damage was common in organic orchards during hand thinning, but scars were rare on harvested fruit.

**Zetzellia mali** were observed in high numbers, and phytophagous mites in very low numbers, in a minimally-sprayed (Vf scab-resistant) organic orchard of apple-scab resistant cultivars. European red mite populations continue to be extremely high in organic orchards treated with sulfur/copper fungicides.

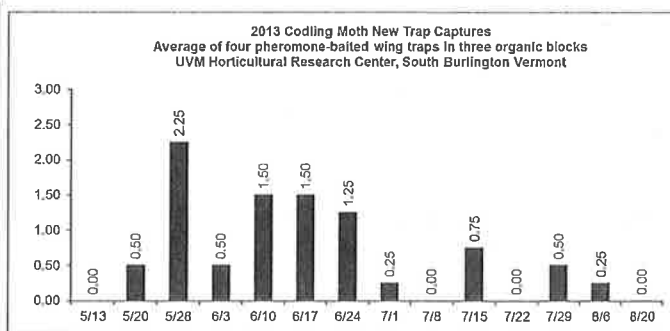
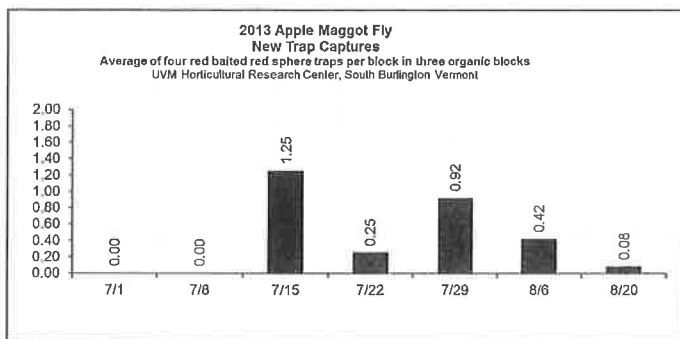
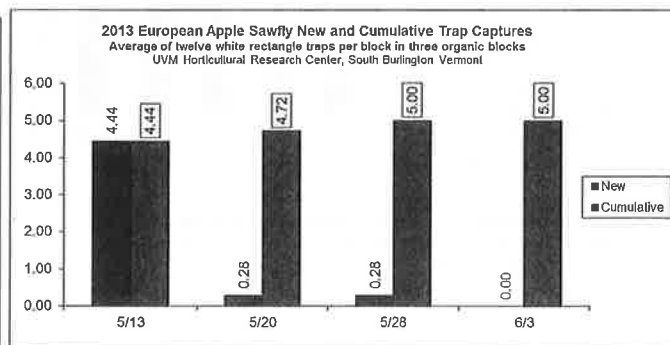
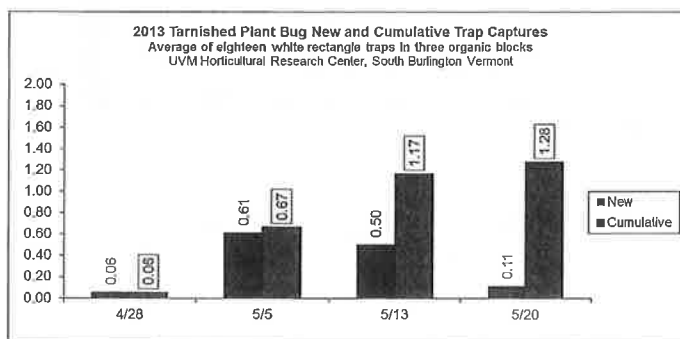
**Phytoxicity** from sulfur and captan applications prior to mid-July heat event were observed in Organic and non-organic orchards at the HRC as well as in grower orchards.

**Apple maggot** continues to be a non-issue in these orchards.

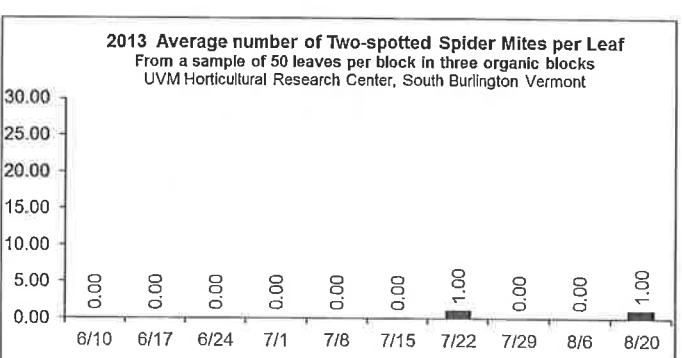
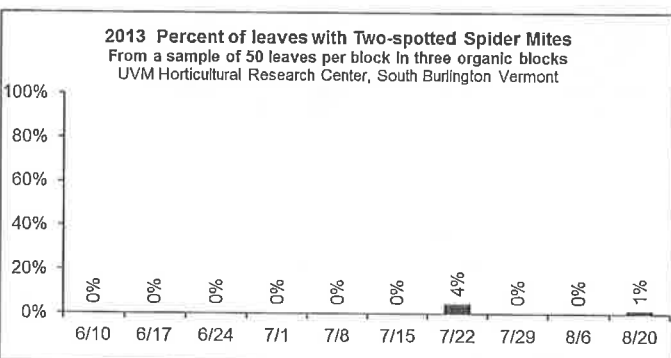
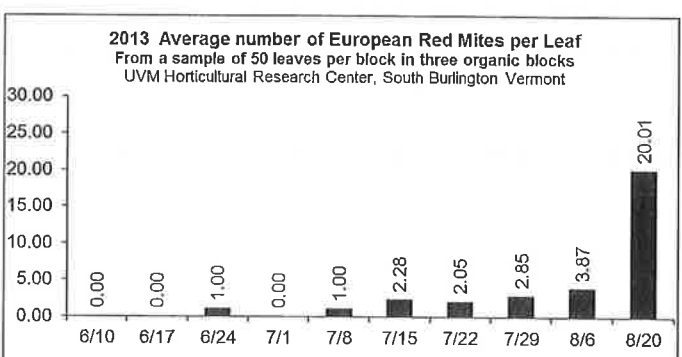
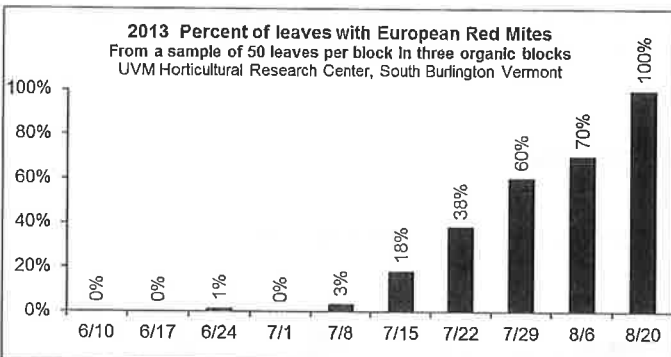
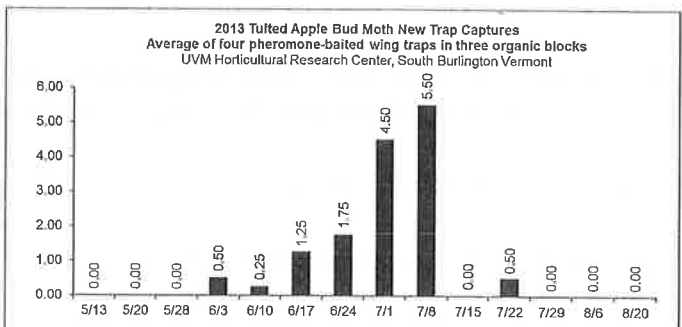
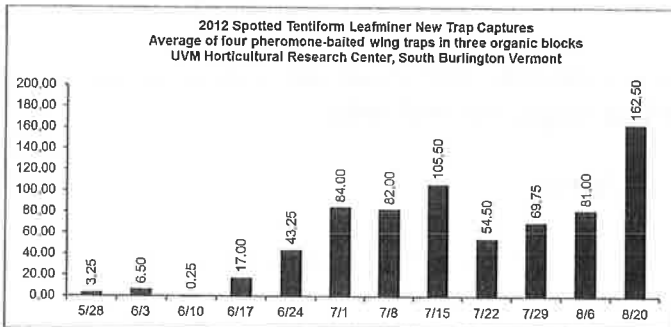
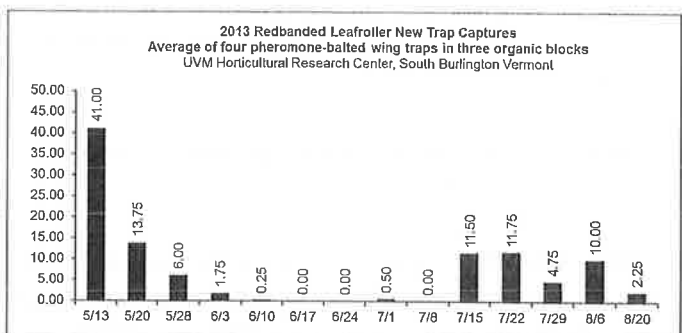
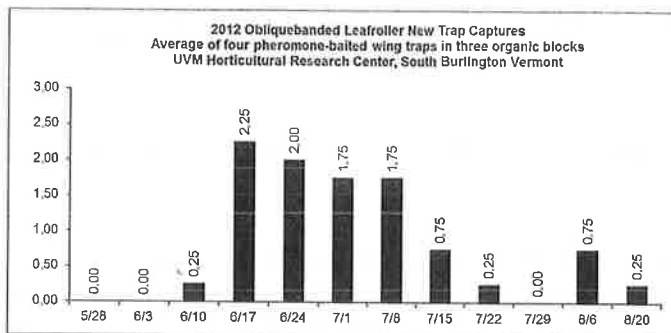
**Plum curculio** and **tarnished plant bug**, did not cause significant damage to fruit as observed at harvest.

**Brown marmorated stink bug** was not observed in the orchards, but **spotted wing drosophila** was identified in the UVM vineyard and in an adjacent row of crabapples.

### Summaries of Weekly Scouting in HRC Organic Orchards:



## Summaries of Weekly Scouting in HRC Organic Orchards (cont.):



Note: No Lesser Appleworm or Oriental Fruit Moth adults were captured in traps in Orchard 1 or Orchard 2 in 2013