

Orchard Outlook



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The past week brought another substantial leap in bud development, particularly on apples. The early breaking cultivars (e.g. Idared, Gravenstein) in the warmest areas are now at green tip, in some cases approaching the mouse-ear stage. Time to be prepared for another spray season...

Bud Development

Checking on bud development on April 18th, Idared was at full green tip in the Kentville area (Figure 1). Bud swell had advanced significantly on pear and plum, while peach, and sweet cherry were still in the earlier stages of swollen bud. Late cultivars of apples are still dormant at this time.



Apple: Dormant –
Green Tip



Pear: Dormant –
Swollen Bud



Peach: Dormant –
Swollen Bud



Plum: Swollen Bud



Sweet Cherry: Swollen Bud

Figure 1: Tree fruit buds observed on April 18th, 2017 in the Kentville/Greenwich area

Diseases

Apple Scab

With early apple cultivars at green tip, they are now susceptible to infection from apple scab, *Venturia inaequalis*. In order to cause an infection, they require a susceptible host and suitable environmental conditions. A susceptible host are apples (and pears for pear scab) that have exposed green tissue (such as Figure 1 – Apple). If there is no green tissue present, there is no susceptible host, and therefore, no possibility for infection. If green tissue is present, the tree is susceptible to apple scab when environmental conditions are suitable for infection.

Primary infections begin from overwintering ascospores on fallen leaves which are released during wet periods in the spring. Primary infections on spur leaves, base of terminal shoots, and young fruitlets will generate secondary spores called conidia which will continue to infect and generate secondary spores until leaf drop. Good control of primary scab is the best method of fruit protection.

Mature ascospores are now likely present in leaf litter from last year. Using a silver tip date of last Wednesday, April 12th, the ascospore maturity model would estimate about 2% of spores have matured to date. Some fungicide protection will therefore likely be needed for early developing cultivars as the potential wetting periods approach at the end of the week and into the weekend.

The environmental conditions needed for infection are wet leaves (rainfall) which remain wet for a duration specified by the Modified Mills table (Table 1). If rainfall occurs and leaves become completely dry before the required wetting period dictated by the Modified Mills Table, and remain dry for a period of 8-12 hours, there is no infection from that rainfall event.

Table 1: Modified Mills table for determining apple scab infection periods.

Average Temperature		Wetting Period (hours)			
(°F)	(°C)	Light Infection	Moderate Infection	Heavy Infection	Appearance of Lesions (days)
33-36	0.5-2.2	48	72	96	---
37	2.7	41	55	68	---
38	3.3	37	50	64	---
39	3.9	33	45	60	---
40	4.4	29	41	56	---
41	5.0	26	37	53	---
42	5.5	23	33	50	---
43	6.1	21	30	47	---
44	6.6	19	28	43	---
45	7.2	17	26	40	---
46	7.8	16	24	37	---
47	8.3	15	23	35	---
48	8.9	15	20	30	17
49	9.4	14.5	20	30	17
50	10.0	14	19	29	16
51	10.6	13	18	27	16
52	11.1	12	18	26	15
53	11.7	12	17	25	15
54	12.2	11.5	16	24	14
55	12.8	11	16	24	14
56	13.3	11	15	22	13
57	13.9	10	14	22	13
58	14.4	10	14	21	12
59	15.0	10	13	21	12

Rainfall currently forecast for Friday through Saturday could potentially be long enough for an infection period in the Modified Mills Table. At 5°C, 26 hours of leaf wetness is required to cause a light infection, which may be possible over the weekend. There is little release of ascospores at night, which means that during primary scab season, if rainfall begins after dark, the leaf wetness hours do not start accumulating until daybreak.

You will need to evaluate your own bud development (i.e. green tissue) before determining if a fungicide will be needed in advance of the upcoming wetting period. At this point in the season, a cover spray of an EBDC fungicide (e.g. Manzate, Dithane, Polyram) or Captan would be most economical. There is no need to consider activity on powdery mildew at this stage. If you plan to use oil for European Red Mite control later on, Captan should be avoided within 7-14 days of an oil application.

Fire Blight

Delayed dormant application of copper at green tip is the first opportunity for chemical control of fire blight. Copper application can be (and has been demonstrated in some studies) to be effective for reducing overwintering fire blight bacteria present on flowers at bloom time. This treatment is most effective in blocks that had fire blight cankers in the previous two seasons.

The goal of copper application is to cover the surfaces of the bark and twigs with a layer of copper which theoretically remains by the time bacterial ooze (Figure 2) is active – typically around Pink – and can be subsequently transported to the open flowers. The challenge is that copper residues can cause problems with phytotoxicity and fruit russetting if residues persist too long after bloom. To avoid fruit russetting, copper applications are therefore typically targeted for green tip. Copper residues need to remain until pink through bloom to control fire blight bacteria at that time.

Retired Cornell University plant pathologist Dr. David Rosenberger explains the basic strategy of copper applications below.

Dr. David Rosenberger (Scaffolds, Vol. 22, No. 1):

For the best suppressive activity on fire blight, copper residues need to persist until at least pink. Fixed copper products (e.g. copper oxychloride, basic copper sulphate) are the least soluble in water, most resistant to washing off, and should provide the longest residual activity. Copper sprays should be used cautiously at lower rates after green tip to avoid problems with phytotoxicity and fruit russetting. A fixed copper application at green tip to suppress fire blight will also give protectant activity against apple scab equivalent to a half rate of an EBDC fungicide. Note copper does not have any post-infection activity.



Figure 2: Bacterial ooze from active overwintering fire blight canker.

The best product to use for this purpose in Nova Scotia is Copper Spray Fungicide (50% copper oxychloride). Some older bag labels indicate a rate of 4 kg/ha, while the newer labels are 3.2 kg/ha. This application provides elemental copper and would be adequate for suppression of fire blight cankers – provided significant rainfall (cumulative 100 mm+) doesn't wash it all away before it is needed. It is recommended that this be applied with 0.5% by volume (5 L in 1000 L) dormant oil to increase adherence. Dormant oil and copper can be tank mixed. This spray should be applied with higher volumes to coat the surface of the twigs and trunks, similar to a dormant oil application. It is recommended that a half rate of an EBDC be included with this application as extra protection for apple scab, unless another fungicide is used. If you plan on using Captan in early season cover sprays, do not include dormant oil with the copper application.

Whenever you are using oil, remember that **oil applied to frost-damaged tissue will greatly amplify any injury so wait 48 hours before and after frost if possible**. Copper may also cause injury to green tissue when applied during frost conditions.

A copper application will likely be appropriate in many areas next week.

Insects

European Red Mite

For best control of ERM, oil application on apples should be delayed for now unless you are planning on tank-mixing your application of copper for fire blight and dormant oil for ERM. To be most effective, oil application for ERM should be targeted closer to egg hatch – around tight cluster.

Pear Pyslla

Oil sprays for pear pyslla should be made as soon as possible if not completed already.

Horticulture

- **Fertilizer**
 - Bud break to bloom is the ideal time for granular fertilizer application to maximize tree growth. Where the need has been demonstrated, foliar nutrients can also improve tree growth and maximize yield and quality. Foliar zinc application to correct a deficiency is most effective early in bud development and should go on in the next week or two.
- **Lime**
 - Lime addition to raise pH is best applied as soon as possible to get the product working in the top layer of soil before the season. Surface applied lime will take a number of years to adjust pH of the soil profile so it is best to apply annually or biannually if you can where it is needed.
- **Herbicide**
 - Studies have shown maintaining weed free strips from bud break to 30-days after full bloom has the greatest impact on tree growth and yield. Timely herbicide application will ensure you make the most of the weed free window. Residual herbicides such as Chateau, Alion, and others offer a much longer weed control period than post-emergent products such as Ignite, Gramoxone, and glyphosate.
- **Pruning**
 - With bud break beginning, ensure that your youngest blocks are pruned first to ensure growth is directed into desirable leader and terminal extension.
- **Grafting**
 - The opportunity to collect scionwood for grafting later is rapidly ending. Most early cultivars are too advanced now for good scionwood material at this point.

Events & Notices

Training Sessions: AgWeather Atlantic & Fire Blight Management - April 25 & 27

For the 2017 season, AgWeather Atlantic (<http://atl.agrometeo.org/weather/local/>) will become the primary source of disease model information available to you for fire blight management in apples and pears. AgWeather Atlantic is an online tool developed by Agriculture & Agri-Food Canada and Solutions Mesonet to integrate real time weather data and forecasts with disease & pest modelling for agriculture. The University of Maryland's Maryblyt fire blight model has been incorporated into AgWeather Atlantic this year in addition to a lot of other features currently live. AgWeather Atlantic is available free of charge and 24/7 to anyone with an internet connection.

Perennia Food & Agriculture will be offering three 1-hour training sessions in order to familiarize producers with using AgWeather Atlantic and understanding the fire blight disease model.

The training sessions will be held in Perennia's training room at the Kentville Agriculture Centre on the following dates & times:

Session 1: Tuesday, April 25th @ 9:00 AM

Session 2: Tuesday, April 25th @ 1:30 PM

Session 3: Thursday, April 27th @ 10:30 AM

Producers are encouraged to bring any browser-enabled device (laptop, smartphone, tablet etc.) to follow along though this is not essential.

Capacity in this room is limited to 20 people and **PRE-REGISTRATION IS REQUIRED TO CONFIRM A SPOT**. Please contact Gail Walsh @ 902-678-7722 or gwalsh@perennia.ca with your preferred session time and number of people attending.

LOST KEYS DURING AIRBLAST SPRAYER CALIBRATION WORKSHOP

A key ring with three keys on it was found near the portable toilet after the airblast sprayer calibration workshop on April 12th. If you think you lost your keys at the workshop, please contact Chris Duyvelshoff at 902-678-7722 or cduyvelshoff@perennia.ca.

Tree Fruit Management Guides Updated

The Pome and Stone Fruit Management Guides have been updated with new crop protection products for 2017. Links are below:

Pome (Apple, Pear) Fruit Management Guide:

http://www.perennia.ca/wp-content/uploads/2015/09/2017-Pome-Fruit-Management-Guide-Final_s.pdf

Stone (Peach, Plum, Cherries) Fruit Management Guides:

<http://www.perennia.ca/wp-content/uploads/2015/09/Stone-Fruit-Management-Guide-2016.pdf>

Organic Apple Orchard Management Guide:

http://www.perennia.ca/wp-content/uploads/2015/09/2017-Organic-Apple-Management-Guide-Final_s.pdf

The Apple Scab & Powdery Mildew Fungicide Groups factsheet has also been updated:

http://www.perennia.ca/wp-content/uploads/2015/09/AS-PM-fungicide-groups-in-NS-2017_3.pdf

This Orchard Outlook has been published with the input of the Orchard Outlook Committee.

Edited by Chris Duyvelshoff