Orchard Outlook

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Bud Development

Checking on bud development Monday, Idared was at early Green Tip on the Middle Dyke Road – a historically early block (Figure 1). Signs of bud swell are evident on pear, peach, and plums with sweet cherry still in the dormant stage.

Apple: early Green Tip – Dormant

Pear: Swollen Bud – Dormant

Peach: Swollen Bud

Plum: Bud Burst

Sweet Cherry: late Dormant

Figure 1: Tree fruit buds observed on April 18th, 2016 in Greenwich and Middle Dyke Road.

2016 Degree Day Accumulations

Degree day accumulations from March 1st to April 18th show that 2016 is still ahead of the 5- and 10-year averages but by not as much as last week (Figure 2).

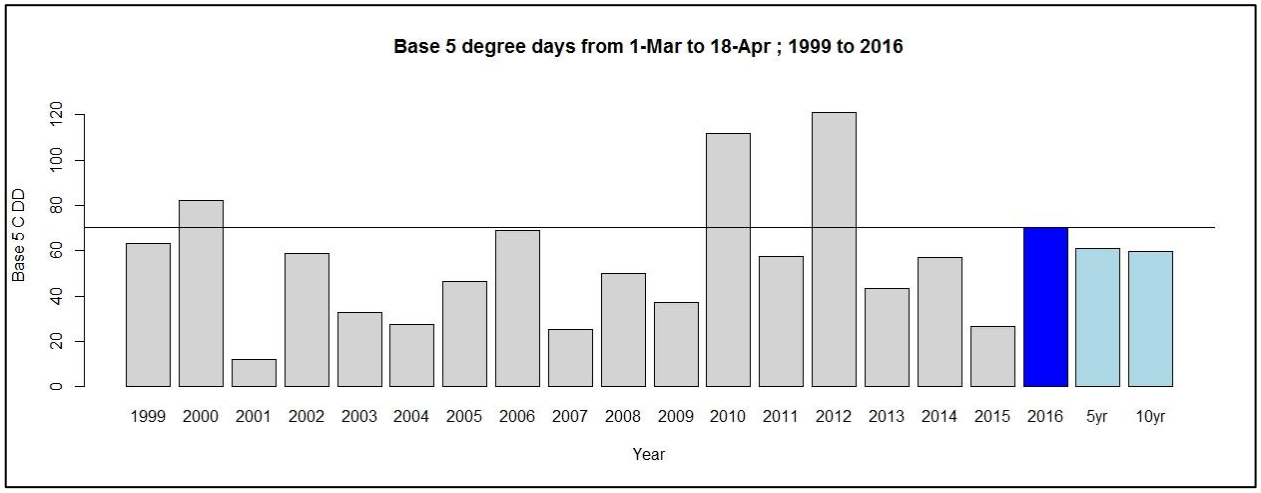

Figure 2: Degree day accumulations from March 1st for the past 18 seasons. Provided by Jeff Franklin (AAFC).

To date heat accumulation since March 1st is (Figure 2):

- About 15% more plant development heat units compared to the 5-year average.
- About 167% more plant development heat units compared to 2015.
- About 2% more insect development heat units compared to the 5-year average.

Diseases

Apple Scab

Mature ascospores of apple scab can now be assumed to be present in the orchard. In order to cause an infection, they now require a susceptible host and suitable environmental conditions. A susceptible host will be 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. 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

Only early cultivars (e.g. Idared, Gravenstein, Zestar) in early sites have any green tissue exposed at this point, and therefore, would be the only ones potentially susceptible to infection from rainfall. As we have also had continuous cold nights the past couple of weeks, the Ascospore Maturity Model predicts just 1% of ascospores would be mature as of April 18th. Given the weather forecast for the remainder of the week, only 2% of ascospores are expected to be mature by Friday, April 22nd.

Rainfall currently forecast for Saturday could potentially be long enough for a wetting period in the Modified Mills Table. However, ascospore maturity will be very minimal, as will exposed green tissue on many cultivars. So possible infection risk for Saturday will likely be very low in most areas. However, with exposed green tissue there is now *some* risk of infection.

Evaluate your own bud development before determining if a fungicide will be needed in advance of Saturday's forecasted wetting period. Early cultivars on early sites may be the only ones with any risk (albeit very low) for Saturday. At this point in the season, a cover spray of an EBDC (e.g.

Manzate, Dithane, Polyram) or Captan would be most economical. There is no need to consider activity on powdery mildew at this point.

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 smother the surfaces of the bark and twigs with a layer of copper which theoretically remains by the time bacterial ooze 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 russeting if residues persist too long after bloom. To avoid fruit russeting, 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 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 russeting. 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.

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 applications 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. This spray should be applied with high 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.

The Green Tip copper application will likely be most appropriate next week in many areas.

Insects

European Red Mite

For best control of ERM, oil application should be delayed 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 is the ideal time for granular fertilizer application to maximize tree growth. With dry conditions in many orchards, this week is a good opportunity for fertilizer application. 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.

Upcoming Events & Notices

Management Guides Updated

Both the Perennia Pome and Stone Fruit Management Guides have been updated with new crop protection products for 2016. Links are below:

Pome (Apple, Pear) Fruit Management Guide:
http://perennia.ca/Pest%20Management%20Guides/Fruits/2016/Pome%20Fruit%20Management%20Guide_2016.pdf

Stone (Peach, Plum, Cherry) Fruit Management Guides:
http://perennia.ca/Pest%20Management%20Guides/Fruits/2016/Stone%20Fruit%20Management%20Guide%202016.pdf

The Apple Scab & Powdery Mildew Fungicide Groups factsheet has also been updated:
http://perennia.ca/Fact%20Sheets/Horticulture/Fruit/Orchard%20Fruit/AS%20PM%20Fungicide%20Groups%20in%20NS%202016.pdf

Fire Blight & Bitter Rot Workshop

Join NSFGA & Perennia for a morning workshop on fire blight control and bitter rot management on **Tuesday, April 26th at 9:00 am at Berwick Fire Hall**.

Dr. George Sundin, plant pathologist at Michigan State University will be the guest speaker. George comes with a lot of experience in fire blight research and management and this will be a great opportunity to ask questions you may have on fire blight. Registration is not required for this workshop.

Apple Fire Blight & Bitter Rot Workshop
Berwick Fire Hall, Berwick
Tuesday, April 26th, 2016 – Indoor Session

9:00 am	**NSFGA Introductions**	**Topic**
9:15 am	Dr. George Sundin, Professor Center for Integrated Plant Systems Michigan State University	Fire Blight Management for 2016
10:15 am	Chris Duyvelshoff, Horticulture Specialist Perennia	A Few Burning Questions on Fire Blight
10:45 am	**Break**	
11:00 am	Dr. George Sundin, Professor Center for Integrated Plant Systems Michigan State University	Bitter Rot Management & Control in Apples
11:30 am	**Fire Blight & Bitter Rot Discussion**	
12:00 pm	**Wrap Up**	

PCRP Credit(s) have been applied for.

Homegrown Success Program Deadline

The deadline for Homegrown Success applications for on-farm improvements in areas such as manure, water, and soil management is closing on April 30th, 2016. See the program guidelines for more information on eligible items at http://novascotia.ca/programs/homegrown-success/. Copies are also available at the NSDA Kentville office.

For further information, please contact Agricultural Resource Coordinator, Brian MacCulloch, 902-679-6006, brian.macculloch@novascotia.ca (Annapolis Valley) or see http://novascotia.ca/agri/programs-and-services/regional-services/ for a list of contacts for other regions.

This Orchard Outlook has been published with the input of the Orchard Outlook Committee and Erika Bent (APM).

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