Orchard Outlook

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Warmer temperatures this past week has resulted in significant bud advancement in many areas. The spray season will begin shortly so sprayers should be out and ready to go and brush should be mowed or moved regularly to allow access to orchards for spraying.

Bud Development

Orchard visits on Tuesday & Wednesday indicated significant bud advancement. Buds of Idared were approaching green tip on the Middle Dyke Road which is historically an early block. Apples range from silver tip on the late cultivars to approaching green tip on the early cultivars in advanced areas (Figure 1). Pears are at swollen bud; peach – swollen bud; plum – bud burst on Japanese cultivars; sweet cherry – swollen bud.

Figure 1: Green tip of apple (top), swollen bud of pear (left), bud burst of plum (centre) and swollen bud of sweet cherry (right).
Photo: http://utahpests.usu.edu/IPM/htm/fruits/home-orchard-guide/ and http://fruit.umext.umass.edu/tfruit/clements/2004budstages/03312004/03312004-Pages/Image3.html.

2015 Degree Day Accumulations

Overall heat unit accumulation is well behind the 5 and 10 year averages. According to Jeff Franklin, AAFC, in a typical year, the heat accumulation to date would normally have been obtained by April 12th. This puts us three weeks behind average in terms of heat unit accumulation. Warmer temperatures forecast for the coming week may allow some catch up on heat units.

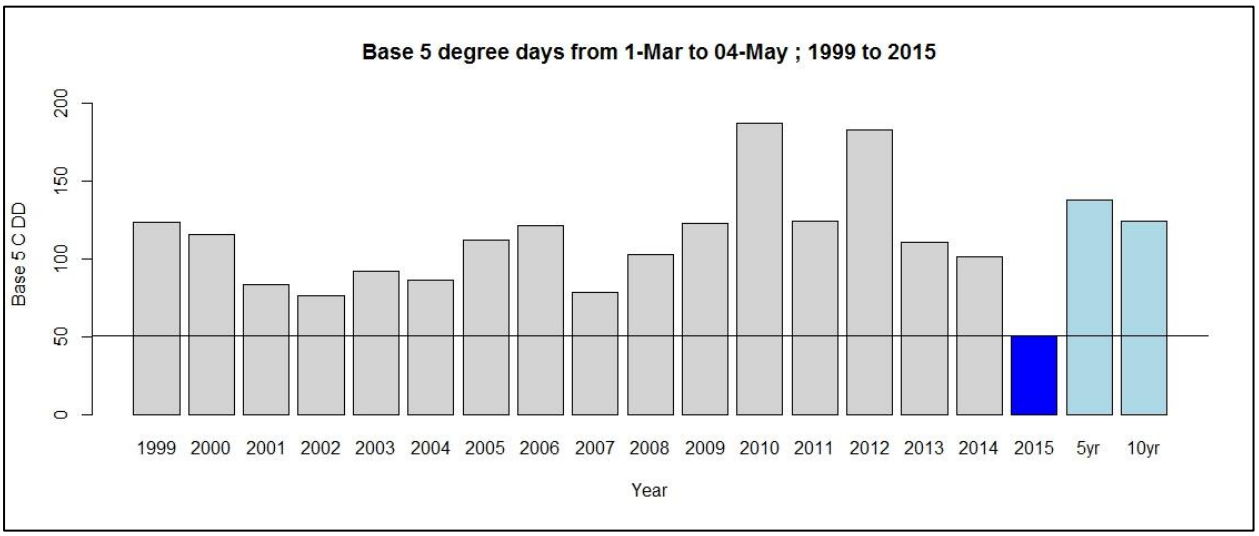

Figure 2: Degree day accumulations from March 1st for the past 17 seasons. Provided by Jeff Franklin (AAFC).

To date heat accumulation since March 1st is (Figure 3):

- About 63% fewer plant development heat units compared to the 5-year average.
- About 50% fewer plant development heat units compared to 2014.
- About 80% fewer insect development heat units compared to the 5-year average.

Diseases

Apple Scab

With green tissue beginning to emerge on apple buds, they become susceptible to infection from apple scab, *Venturia inaequalis*. Primary infections begin from overwintering ascospores which are released during wetting periods in the spring according to Modified Mills Table (Table 1). Primary infections on spur leaves, base of 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 have been identified by Eric Bevis, AAFC, and therefore can be assumed to be present in the orchard at this point. However, just a small percentage of ascospores (around 2%) would have matured to date. Ascospore maturity will advance with warm weather. If the weather forecast stays accurate, than around 10% of ascospores will be mature by the end of the day Sunday.

With the rate of tissue development excepted over the next 4-5 days and the additional maturation of ascospores, it would be advisable for growers to get on a cover spray before the next wetting period which is currently forecast for Monday. At this point in the season, a cover spray of an EBDC or Captan would be most economical. There is no need to consider activity on powdery mildew at this point. If you plan to use Superior Oil for European Red Mite or with copper for fire blight cankers then avoid the use of Captan within 7 days (preferably 14) before and after oil application.

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

Average Temperature		Wetting Period (hours)			
(^oF)	(^oC)	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

Fire Blight

The first opportunity for chemical control of fire blight in 2015 will be an application of copper at green tip. Copper application can be effective for reducing overwintering fire blight bacteria in the ooze present around cankers. This treatment is most effective in blocks that had fire blight cankers in the previous few seasons. It is noted that a grower yesterday has observed bacterial ooze from rootstock blight in an infected Gravenstein tree.

The goal of copper application is to smother the cankers and surfaces of the bark with a layer of copper 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 russetting if residues persist too long after bloom. To avoid fruit russetting, copper applications are typically targeted at green tip. Copper residues need to remain until Pink to Bloom to control fire blight bacteria in the ooze 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). It has come to my attention that the bag label allows for application at 4 kg/ha. This would apply 2 kg/ha of elemental copper and would be adequate for suppression of fire blight cankers. 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. If copper will be the fungicide for apple scab, it is recommended that a half rate of an EBDC be included with this application. If you plan on using Captan in early season cover sprays, do not use dormant oil with the copper application.

Insects

European Red Mite

The closer an oil treatment is applied to egg hatch, which usually begins around tight cluster to pink, the more effective it is. However, as oil applications need to go on dilute with high volumes, growers may be considering tank mixing oil with their copper application for fire blight. For those who need to begin soon to spray dilute over the whole orchard, **oil application for European Red Mite and copper sprays are compatible.** It would be preferable to wait for oil application for ERM but this may not be a realistic approach in some orchards. Erika Bent (APM) reminds growers that oil-sensitive varieties such as Red Delicious, Ambrosia, and Gala should be oiled first.

When 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. Never apply captan and oil together or Captan within 7 days (preferably 14) prior to or following an oil treatment. Sulphur applications (e.g. Kumulus) are also not compatible with oil and should not be used within 30 days of oil. For European Red Mite control, use either Superior Oil 70 or Purespray Green Spray Oil at 60 L/ha or 20 L of oil per 1000 L of spray. Oil will not affect two-spotted spider mite or apple rust mite as they overwinter as adults.

Pear Pyslla

Oil sprays for pear pyslla should be done as soon as possible if not completed already. There will be plenty of egg laying activity with the temperatures this coming week.

Horticulture

Young Tree Pruning

With bud break starting to happen on apples, it would be advisable to get any 2nd and 3rd leaf trees pruned to make sure they put maximum growth into desirable wood and fill their space. Return to the mature blocks after the young trees are completed.

Fertilizer/Lime

Bud break 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. Zinc application to correct a deficiency is most effective early in bud development and should go on in the next

week or two. Boron application to improve fruit set should occur around pink for the best effect on blossom quality and fruit set.

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 if you can where it is needed.

Nutrient Sufficiency Ranges

Annual applications of nutrients should be based on tissue sampling. Tissue samples are collected in late July/early August. The nutrient sufficiency ranges for apples based on experience in Nova Scotia are below:

Tissue Samples		**Soil Samples**	
Nitrogen	1.9 – 2.4 (%)	pH	6.0 – 6.5
Phosphorous	0.15 – 0.30 (%)	Phosphate	472 – 650 kg/ha
Potassium	1.2 – 1.6 (%)	Potash	381 – 490 kg/ha
Calcium	1.0 – 1.6 (%)	Calcium	2,001 – 3,351 kg/ha
Magnesium	0.20 – 0.28 (%)	Magnesium	336 – 446 kg/ha
Boron	20 – 40 (ppm)		
Iron	50 – 400 (ppm)		
Manganese	25 – 200 (ppm)		
Copper	4 – 50 (ppm)		
Zinc	15 – 40 (ppm)		

Spring Herbicides

Weeds are beginning to grow under the trees and herbicide application should be considered soon to be most effective. The critical weed-free period (to maximize yield) for bearing apples is from budbreak to 30 days after bloom. This has been demonstrated recently in high density orchards in New York. The pre-emergent herbicides (e.g. Alion & Chateau) do not kill actively growing weeds and need to be applied to the soil for residual activity. A tank-mix with a burndown of glyphosate or glufosinate ammonium should be used to control actively growing weeds if a residual is to be used. Recent evidence is indicating that trunk contact with any of these burndown herbicides may be implicated in later damage. It is best to avoid all trunk contact if possible.

> Alion (indaziflam) provides long residual control of a broad spectrum of annual grasses and broadleaf weeds. Good residual weed control has been observed with Alion in established orchards in Nova Scotia. Do not apply Alion to orchards prior to their 4th leaf.
>
> Chateau (flumioxazin) provides good residual control of weeds in orchards. Do not apply Chateau to fine-textured clay soils, orchards in the planting year, soils with greater than 5% organic matter, or to non-dormant apples and pears. Chateau cannot be applied after bud break and it should go on immediately if it's to be used – on early cultivars it will likely already be late for Chateau without hooded spray equipment.

See Guide to Weed Management in Orchards for the weed control spectrum of these herbicides. See product labels for rates & tank-mix suggestions.

Deer Damage?

NEW - Wildlife Damage Mitigation

A Wildlife Damage Mitigation component has been added into the Home Grown Success Program under the Production Management section of Environmental Management and Innovation to minimize the damage to crops and/or equipment. The details on eligible items and requirements are outlined in the program guidelines. The deadline to apply is **Friday, May 15**. Producers who have already submitted their Home Grown Success application will be given an opportunity to amend their application if they would like to include deer fencing.

See http://novascotia.ca/agri/programs-and-services/financial-funding/growing-forward2/ for details. Questions should be directed to your local NSDA regional office: http://novascotia.ca/agri/programs-and-services/regional-services/

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

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