Orchard Outlook

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Well, I think I can safely say that spring is here and winter is fading fast. Looking back to the first issue of Orchard Outlook last season on April 9th, 2014, the discussion of the long winter was on the first page. I don't think anybody would have predicted it would be followed by an equally long and snowier one. Once again Orchard Outlook is here to provide updates on the growing season and deliver important messages for the tree fruit industry.

2014 Fire Blight Impact Survey

To better understand the impact of the 2014 fire blight disease outbreak on the tree fruit industry, the Nova Scotia Department of Agriculture has requested that a survey be conducted to follow-up on the previous survey done last September.

The survey will target Nova Scotia tree fruit producers with a minimum annual gross revenue of $10,000 derived from tree fruit.

The responses to these questions will be used to further quantify the impact of fire blight for use by the Nova Scotia Department of Agriculture, the Nova Scotia Fruit Growers' Association, Perennia, and Agriculture and Agri-Food Canada.

The survey will be open until noon on Wednesday, April 22nd.

Survey responses are anonymous. Thank you for your time and input on this important survey.

Please use the following link to access the survey:
https://www.surveymonkey.com/s/fireblightapril

If you cannot access the online survey, please contact me at 902 678 7722 or cduyvelshoff@perennia.ca.

Winter Weather Review

The winter of 2014/2015 was quite unique as we started off with mild temperatures in November and December followed by a prolonged period of low minimum temperatures throughout January, February, and March. This is most evident in the average temperature for the month of February which is nearly 6°C below the average for the previous two winters. January, February, March, and April to date have all had average temperatures below what would be considered to be normal (Table 1).

Table 1: Extreme low temperatures and average temperature by month from December to March for the past three winters.

Month	Extreme Low (2012/2013)	Extreme Low (2013/2014)	Extreme Low (2014/2015)	Average Temp. (2012/2013)	Average Temp. (2013/2014)	Average Temp. (2014/2015)
December	-14.2	-15.5	-12.1	-0.2	-2.9	0.8
January	-17.9	-21.5	-18.6	-5.5	-4.3	-6.5
February	-23.0	-19.0	-20.7	-4.2	-4.5	-10.1
March	-12.1	-20.7	-19.9	0.7	-3.7	-4.4

Given that we began the winter with relatively mild temperatures in December, allowing trees to acquire complete dormancy before any extreme cold snaps, I do not believe that winter injury will be a significant problem after the past winter. The recent cold morning of April 6th where the temperature fell to -13.2°C – breaking many regional records – still occurred with a high level of dormancy in trees due to the delayed spring, therefore, shouldn't cause any serious injury. In comparison, the typical extreme low for April is around -4 to -5°C in the previous 5 years.

The snow was the big story this past winter with what seemed like endless storms in February and March. Over 250 cm of snow fell at the Kentville Research Centre between the end of January through March. The number of late storms was especially unique leading to an unprecedented amount of snow at the end of March compared to recent memory (Figure 1). The question now becomes how quickly will it melt?

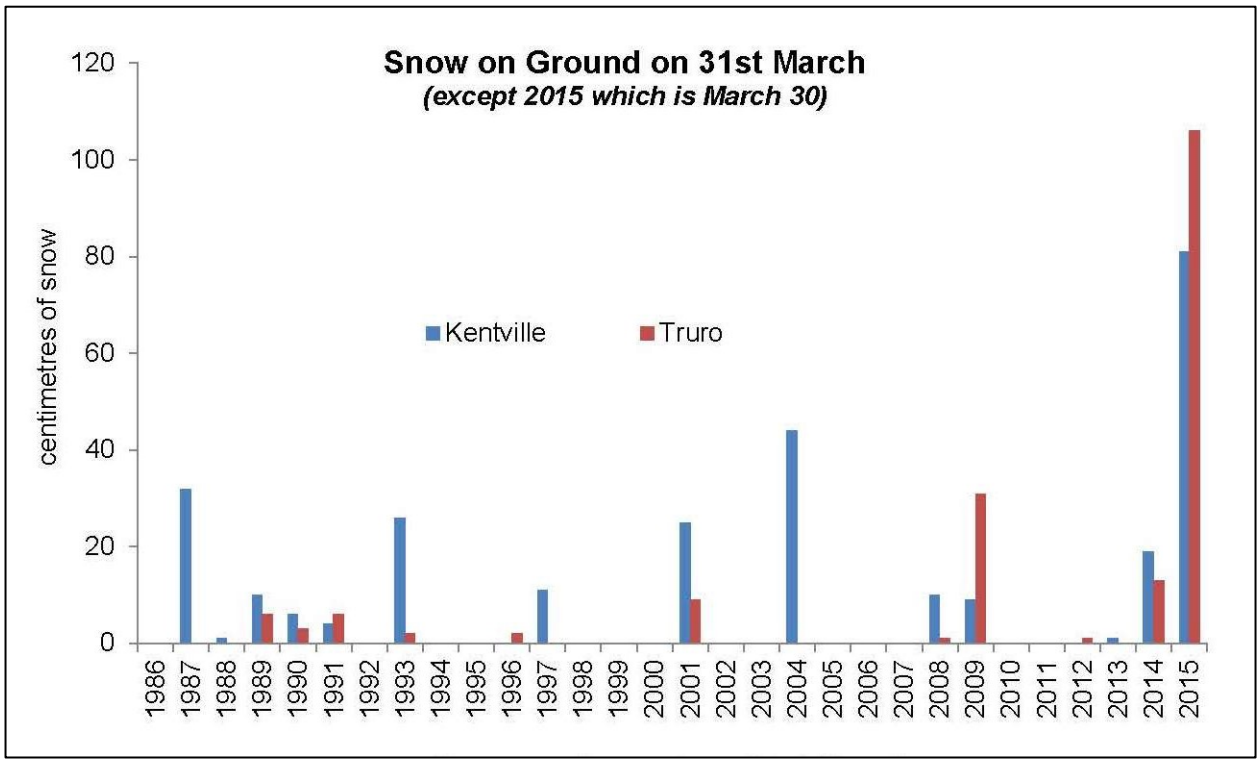


Figure 1: Snow on ground on March 31st from 1986 to 2015 at the Kentville Agriculture Centre.

Snow Melt – Jeff Franklin, Agriculture and Agri-Food Canada, Kentville

The main weather story for 2015 is shaping up to be the amount of snow on the ground and the late spring. I expect that all who read this will be in agreement that we have had a harsh winter, at least in terms of snowfall. We have been keeping snow depth records at the Kentville Research station since 1959, and there have only been three years where our depth of snow exceeded 1 meter (100 cm). Specifically those years were 1987, 1993, and 2015. In both 1987 and 1993 the snow began to melt around the first day of spring and, with the typical Nova Scotia spring temperatures, was completely gone by the middle of April. This year the melt also began close to the first day of spring, but the cooler temperatures have slowed down the snow melt. Normal temperatures for the month of April should be a maximum of 9.9°C and a minimum of 0.6°C. So far the maximum and minimum temperatures for April have averaged 6.7˚C and -2.5˚C respectively.

As of Tuesday we were still measuring 36 cm of snow cover at our weather station in Kentville, which is considerably less than the 109 cm recorded on March 18th. Given the rate at which the snow is currently melting, it will be another week before we are down to bare ground in open fields and longer in areas where drifting created 2 meters or more of snow cover. The precipitation that we have received since the end of January has, for the most part, been snow. Our records show that the rainfall equivalent of all the precipitation we received since the end of January to be just over 300mm or 1 foot. Most of this precipitation has been stored as snow cover for the winter and is still being released now. The result of 1 foot of water being released in three to four weeks of snow melt will likely delay access to fields and orchards for some time after the snow has gone.

Green Tip Prediction – Jeff Franklin, Agriculture and Agri-Food Canada, Kentville

As the snow continues to melt we turn our attention to green tip, the next significant event in the orchard calendar. For the last two years I have used a development model from Cornell University to predict the timing of green tip in apple for the Valley. In both of these years the model has given a reasonable prediction of 50% green tip for most Valley orchards.

The fruit buds that are developing now were produced last July. These buds did not continue to develop after they were produced as high levels of natural inhibitors were present in the new buds. This rest period, as it has been called, continues as long as temperatures stay warm and does not complete until after significant period of chilling has occurred. It has been shown in apple that it takes between 1000 and 1200 accumulated chilling units to complete the rest period. There are different models for tracking chill units but the chilling required to break the rest period in apple has been shown to occur at temperatures between 0°C and 16°C. In most years we meet the chilling requirement in December and in this past winter we met the requirement on December 12.

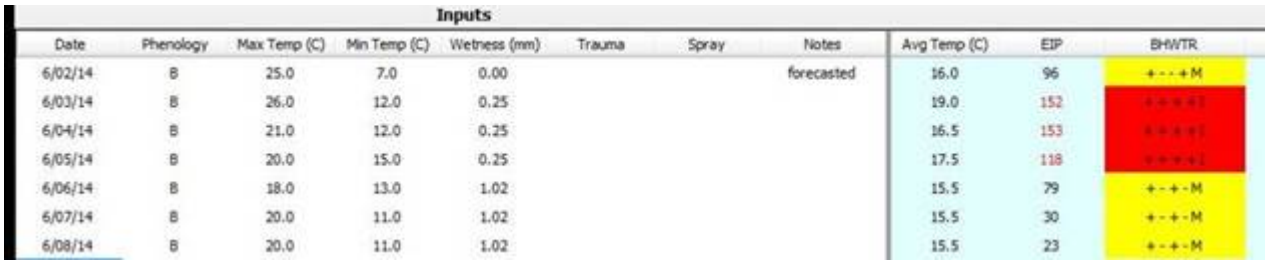
This means that after this date any temperatures above 4.4° C would result in bud development. If you remember back to December and January there were several bouts of warm temperatures which according to the model resulted in a small amount of development. This development paused for the months of February and March and only began again last week. As of Tuesday morning we had accumulated 800 of the 2500 degree hours required for green tip. When I look back to the prediction I made last year we were further along in bud development by approximately 1 week. Keep in mind that last year we also experienced a slow start to spring and green tip did not happen until the end of April. The forecast for the rest of this week is below seasonal temperatures with seasonal temperatures

returning by the weekend. With so many degree hours to go it is difficult to say when the buds will break but it is highly unlikely that they will break before the end of April. Unless there is a significant change in the weather, I do not expect to see green tip until early May.

Final Maryblyt 7.1 Workshop – Fire Blight Management – 1.0 PCRP Credit

A final session of the Maryblyt workshop will be held on **Tuesday, April 21st at 10:00 am to 12:00 pm** in the Perennia Training Room of the Kentville Agriculture Centre for those who were unable to attend previous sessions.

Do you want improved control of fire blight in 2015? Are you familiar with Maryblyt?



Inputs										
Date	Phenology	Max Temp (C)	Min Temp (C)	Wetness (mm)	Trauma	Spray	Notes	Avg Temp (C)	EIP	BHWTR
6/02/14	B	25.0	7.0	0.00			forecasted	16.0	96	+ - - + M
6/03/14	B	26.0	12.0	0.25				19.0	152	+ + + + F
6/04/14	B	21.0	12.0	0.25				16.5	153	+ + + + F
6/05/14	B	20.0	15.0	0.25				17.5	118	+ + + + F
6/06/14	B	18.0	13.0	1.02				15.5	79	+ - + - M
6/07/14	B	20.0	11.0	1.02				15.5	30	+ - + - M
6/08/14	B	20.0	11.0	1.02				15.5	23	+ - + - M

Do you understand what the output means? Maryblyt is a computer-based forecasting model developed to provide warnings on key periods of blossom infection and disease symptom development for fire blight. This program assists in timing antibiotic applications for maximum effectiveness on blossom blight – the critical phase of the disease.

In order for you to better understand the model output, as well as potentially run a Maryblyt forecast for your own farm, Perennia will be offering a session to walk you through the program. This will be held in the Perennia training room with a capacity of about 20 participants. You may bring your own laptop to follow along, if you do, please download and install the program in advance at http://www.caf.wvu.edu/kearneysville/Maryblyt/. This website has more information on the program.

Attendance will qualify for 1.0 PCRP credit. Please register with Gail Walsh in advance at gwalsh@perennia.ca or 902 678 7722.

Fire Blight Resources

The following fire blight resources are available for downloading for your reference.

Presentation: Part 1 – Nova Scotia's 2014 Fire Blight Epidemic

A review of the history of fire blight in Nova Scotia, the progression of the 2014 fire blight epidemic, lessons learned from 2014, and pictures of fire blight symptoms.

Link: http://www.nsfgaconvention.com/Presentations/Fire%20Blight%20Epidemic%20in%202014.pdf

Presentation: Part 2 – 2015 Management Plan

An overview of the fire blight disease cycle and 7 management steps for 2015.

Link: http://perennia.ca/PDFs/Tree%20Fruit%20Workshops/Fire%20Blight%20-%20Part%202%20-%20Action%20Plan%20for%202015.pdf

Presentation: Fire Blight in New York – Epidemics, Management, and Recovery

Presented by Dr. David Rosenberger of Cornell University (retired).

Link: http://www.nsfgaconvention.com/Presentations/Fire%20Blight%20in%20New%20York%20-%20Epidemics,%20Management%20and%20Recovery%20-%20Dave%20Rosenberger.pdf

Presentation: Michigan Orchards: Industry Overview & Highs and Lows with Fire Blight
Presented by Philip Schwallier of Michigan State University Extension.
Link:http://www.nsfgaconvention.com/Presentations/Michigan's%20Fruit%20Industry%20and%20Fire%20Blight%20-%20Phil%20Schwallier.pdf

Factsheet: Fire Blight Management in Nova Scotia
Outline of management steps necessary for fire blight control.
Link: http://perennia.ca/PDFs/Fire%20Blight%20Management%20in%20Nova%20Scotia.pdf

Factsheet: Integrated Management of Fire Blight on Apple and Pear in Canada
Agriculture and Agri-Food Canada factsheet on fire blight management.
Link: http://www.agr.gc.ca/eng/about-us/offices-and-locations/pest-management-centre/publications-and-newsletter/sustainable-crop-protection-factsheet-series/integrated-management-of-fire-blight-on-apple-and-pear-in-canada/?id=1185385723877

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

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