

Volume 9, No. 1**April 2, 2009****This issue contains:**

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Pruning

So far the weather has not been great for pruning with the snow load in orchards being heavier than normal. There is still a significant snow load in many orchards in Kings County. Hopefully this will be greatly diminished over the next few days with the forecast for rain and warmer temperatures. A lot of pruning will have to go on during the next month to make up for lost time in March. There is one major point that I would like to make with regards to pruning this year and that is to open the tree up and bring the tree height down to where good spray coverage can be obtained. This will help with disease and insect control and hopefully avoid additional spray where control was not obtained due to poor spray coverage.

Apple Scab

These last couple of days has been more spring like and the snow is slowly disappearing so it will not be long before another spray season is upon us. The biggest news with regards to fungicides is not that we have new products but that the price for products has gone up significantly. Growers really do not have the option of eliminating or cutting back on fungicide that's if they want to send their fruit to the fresh fruit market. So are there options for reducing fungicide application? I think that the best option would be to control primary scab infections so that that you are not faced with having to control secondary scab infection late into the growing season. I would encourage you to read the following publication [Apple Scab: Improving Understanding for Better Management](http://www4.agr.gc.ca/resources/prod/doc/sci/pub/pdf/carisse_scab_e.pdf) which can be obtained from this website

http://www4.agr.gc.ca/resources/prod/doc/sci/pub/pdf/carisse_scab_e.pdf

It talks about possible means to reduce overwintering spores to reduce spore numbers and disease pressure during the primary scab season. It also has a model to assess disease pressure which in turn could be used in determining the need to apply fungicide. Much of this work is preliminary and would need to be assessed for Nova Scotia conditions. I read another very interesting article in the March 30th issue of Scaffolds which is tree fruit news letter published by Cornell. <http://www.nysaes.cornell.edu/ent/scaffolds/2009/090330.pdf>. I found Dave Rosenberger article "A review of Apple Fungicides for 2009" to be very informative especially when he discusses the advantages of rain-fast and/or re-distribution attributes of fungicides. Reading these articles may assist you with your 2009 apple scab program and possibly reduce costs by not having to control infections that have become established on the leaves or fruits.

Control of primary scab is critical so it never hurts to refresh your memory about the life cycle of scab and the following is from the **Nova Scotia Pest Management Fact Sheets**.

APPLE SCAB

Venturia inaequalis (Cooke) Wint.

INTRODUCTION

Apple scab, caused by the fungus *Venturia inaequalis*, is the most economically important disease of apple. It occurs in most apple producing areas of the world, but is most serious in cool, moist climates. In Nova Scotia, crop losses exceeding 70 percent may occur if the disease is left uncontrolled. In addition to apples, the fungus will also attack hawthorn, mountain ash, crab apple and wild apple.

SIGNS AND SYMPTOMS

Initial infections generally occur on leaves surrounding flower buds. Velvety, olive green areas first appear on the undersides of new leaves 10 to 28 days after infection occurs. As these lesions age, they become circular, dark olive green or brown spots. Severe infections cause leaves to become stunted and distorted. Lesions may remain on the undersides of leaves, or they may spread to the upper surface as well. Lesions on young fruit are similar in appearance to those on leaves, but as fruit grow, the lesions become brown and corky. These types of infections kill cells early in the season, and as uninfected tissue continues to grow, cracks develop in the surface of the fruit. Early season infections tend to cluster near the calyx end of the fruit and can be seen before harvest, while those which occur in late summer or early fall may not appear until after the fruit are in storage.

DISEASE CYCLE

The fungus overwinters in leaf litter on the orchard floor. During the winter and early spring, small, black fruiting bodies called 'pseudothecia' develop in the infected leaves. By 'bud break', these structures contain hundreds of spore sacs which swell with water and shoot sexual spores called 'ascospores' into the air when it rains. The ascospores are carried on air currents to the wet surfaces of leaves and fruit where they will germinate and grow into the apple tissue. This is called the primary infection, and the time required for it to occur is dependent on temperature and available moisture (the relationship between temperature and wetness is given in Table 1). The primary infection period begins at 'bud break' and continues for up to two months. After it enters the plant, the fungus grows just beneath the surface of the leaf or fruit and eventually, a scab lesion will develop. 'Conidia' (asexual spores) are produced on the lesion's surface and carried by wind and rain to new leaf and fruit surfaces where they germinate, enter plant tissue and produce new lesions and conidia. These are secondary infections and may occur several times throughout the season.

DISEASE MANAGEMENT

At the present time, scab is primarily controlled by applications of fungicides. Most of these have short post-infection activity and are applied as protectants. For these types of chemicals to be effective, they must be present on leaves and fruit during infection periods. As new growth emerges and rain washes fungicides off older foliage, trees are left unprotected; therefore, it is important to know when another application is necessary. In most situations, an interval of 7 to 10 days between fungicide applications during the primary infection period is recommended, but this may be adjusted according to weather conditions. If trees are well protected during the primary infection period, fewer fungicide applications will be needed later in the season, during the secondary infection period. A new group of fungicides with longer periods of post-infection protection has recently become available in Canada. These fungicides have the ability to kill the fungus 72 to 96 hours after it has penetrated the plant tissue, and need only be applied when an actual infection period has occurred. However, heavy reliance on these chemicals should be avoided, to prevent the causal fungus from developing resistance to them. Several scab resistant apple varieties which require no fungicide applications for scab control are also available. However, long term horticultural properties and the marketability of these varieties may not be fully known at this time, and studies are ongoing. The following table was taken from the compendium of Apple and Pear Diseases which was edited by A.L. Jones and H.S. Alderwinckle and published by the American Phytopathological Society.

Modified Mills Table for determine scab infection periods and appearance of scab lesions

Average Temperature		Wetting Period (hours)			Appearance of Lesions (days)
(°F)	(°C)	Light Infection	Moderate Infection	Heavy Infection	
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
60	15.6	9.5	13	20	11
61	16.1	9	13	20	10
62	16.7	9	12	19	10
63-75	17.2-23.9	9	12	18	9
76	24.4	9.5	12	19	---
77	25.0	11	14	21	---

Pear Psylla

Those growers that still have pear trees will need to consider the application of dormant oil some time after the middle of April. The application of dormant oil is still a viable option for psylla control enough though the cost of oil has gone up. In recent years adults and egg laying has been observed earlier than the last week of April, when was the traditional period for oil application, in Nova Scotia Orchards. Psylla egg laying takes place over an extended period thus if you apply oil early in April you may wish to consider a split application or use the maximum allowable rate to obtain an extended control period. The article on Psylla in the above mentioned Scaffold Newsletter is also worth reading.

The Orchard Management Schedule

This publication has been revised for 2009/2010 and should be available in hard copy and on AgriPoints website before the end of the month.

Contributions and consultations were made in the preparation of this newsletter with the Orchard Outlook Committee, Dick Rogers of Wildwood Labs, and Dr. Rob Smith

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