

Orchard Outlook Newsletter

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Fruit Development

Fruit continues to size with the average fruit size of McIntosh at 30 mm. The July drop is still ongoing.

2003 Degree Day Accumulations

Table 1.0 Degree day accumulations as of July 13, 2003 based on Kentville weather data. (Information contributed by Michelle Larsen & Dr. Rob Smith, AFHRC, Kentville)

Category	2000	2001	2002	2003	5 year average
Plant development (Base 5°C)	776.4	746.1	766.6	813.4	839.3
Insect development (Base 10°C)	380.0	397.2	397.6	445.9	445.8

Apple Scab

Two secondary infection periods were recorded at Kentville during the past week. A wetting period began at 2:00 pm on Friday, July 11th and ended at 11:00 am Saturday, resulting in the first infection. The average temperature was 19°C with the infection being established by 11:00 pm on Friday. The second infection resulted from the wetting period that began around 1:00 pm on Tuesday, July 15th and was still ongoing at the time of the Orchard Outlook meeting. Infections at this time of year are a mixed blessing, as the moisture from the wet period is usually needed. Growers would be advised to continue with their fungicide programs until the end of this month particularly in fresh fruit blocks.

Powdery Mildew

This fungus will continue to spread under warm humid weather conditions however as terminal buds are set the foliage will become more resistant to infections. Fungicide applications to slow the spread of this disease would be warranted on susceptible cultivars where mildew infections are already moderate to heavy. Keep a check on young plantings as mildew infection will adversely affect tree growth.

Frog-eye Leaf Spot

Frog-eye leaf spot infections have become more visible in orchards during the past two weeks. Most of these infections likely occurred during the wet weather prior to and following bloom. I have not observed any serious cases of this disease and with dry weather conditions this fungal disease should not present a major problem for most growers.

Fire Blight

Young plantings should be checked on a regular basis throughout the growing season for fire blight infections.

Codling Moth

The majority of the codling moth flight and hatch should have taken place by now. Growers should, however, continue to monitor traps for the next week or so. Trap captures of 10 or more moths following treatment for codling moth would warrant a second insecticide application.

Apple Maggot

Dr. Rob Smith has reported sporadic trap captures during the past week, with no sustained emergence of apple maggot. Growers should be monitoring trap captures and capture of a maggot fly would indicate that treatment is required. Treatment for maggot could begin late next week based on trap captures.

White Apple Leafhopper

A white stippling on the upper surface of leaves is an indication of leafhopper feeding. Fruit quality can be reduced by feeding damage on the fruit as well as by the droppings left on the fruit by the adults. The next opportunity to treat for this insect will be in early August once the second generation nymphs have hatched.

Bug of the Week- Lesser Appleworm

In the June 25th issue of the Orchard Outlook I wrote an article on Oriental fruit moth as 'Bug of the Week' because of the suspected capture of this moth in Nova Scotia. Moths similar to the Oriental fruit moth had been caught in traps baited with the Oriental fruit moth pheromone placed in several Valley orchards. These moths were sent to Ottawa for identification and were identified as the moth of the lesser appleworm. The Oriental fruit moth and lesser appleworm are very similar in appearance and the lesser appleworm moth is attracted by the Oriental fruit moth pheromone. This is good news in that we do not have a new orchard pest in Nova Scotia, as the lesser appleworm is native to North America and was likely in Nova Scotia prior to the planting of commercial orchards. Lesser appleworm can be found where apples, plums and cherries are grown and in native plants such as hawthorns, native species of plum and crabapple, cherries and possibly roses.

The life history is similar to that of the codling moth but it may produce a full second generation where codling moth may produce a partial second generation. The second generation population greatly exceeds that of the first. This moth overwinters as a full grown larva and is on the wing during June.

Their emergence is likely just ahead of the codling moth. First generation larvae are full grown by mid-August. The appearance of second generation larvae may be quite extended, lasting from September into late October.

The larvae more commonly enter the fruit at the calyx end with a few entries at the stem end and still fewer on the side of the apple. As with codling moth, feeding damage is detected by the pile of frass at the feeding site. The larvae are shallow feeders and usually do not burrow deeper than about 7 mm unlike codling moth which goes to the seed cavity. When entering the side of the fruit the larvae channel just beneath the skin producing a blotch-type mine. It is interesting to note that a high percentage (90%) of feeding damage by the second generation takes place at the calyx end. Some shoot infections can take place during the emergence of the first generation but not to the extent that Oriental fruit moth enters young vegetative shoots. The larva of the lesser appleworm can be distinguished from that of the codling moth by an anal comb, which the codling moth does not have. The adult lesser appleworm is a small moth, about 5 to 6 mm long. The body colour is dark brown with a gold band across its back.

The lesser appleworm is considered not to be of economic importance in commercial orchards as insecticides applied for other pests such as codling moth have kept it under control. It is felt that this pest is more sensitive to pesticide than codling moth. On the other hand it may become more of a problem as chemical control practices ease.

Foliar Calcium Applications

Calcium is one of the major nutrients that directly affect fruit quality. Calcium deficiency in the fruit can express itself in several forms:

- 1) bitter pit, which can appear in the fruit during the growing season or after the fruit has been placed in storage,
- 2) senescent breakdown of apples in storage,
- 3) fruit scald and
- 4) fruit decays that develop during storage.

The level of calcium in the flesh of apples is influenced by many factors and therefore growers are encouraged to follow good horticultural management techniques that will improve soil conditions, encourage uniform annual cropping and encourage moderate tree vigour. The application of foliar calcium is only one in a series of techniques that producers should be utilizing to prevent calcium related disorders and that these sprays should be the last resort in correcting a calcium deficiency.

The application of calcium to the fruit by means of foliar spray or post harvest dip will raise the level of calcium in the fruit flesh. The level by which the calcium is raised is dependent on the amount of calcium applied to the apple. The amount of calcium required will depend on the severity of the calcium disorder and the objective of the calcium spray program. The *Pennsylvania Tree Fruit Production Guide* recommends the application of 4.5 kg to 15.5 kg/ha of actual calcium per season to control problems. The upper end of this application rate would require 6 to 8 sprays. Growing and environmental conditions in Nova Scotia are such that calcium related disorders are not as severe, as those in warmer climates and in most situations the lower end of the suggested annual application rate (4.5 to 8.5 hg/ha per year) should correct bitter pit problems. In most cases 4 to 6 foliar applications should correct or greatly reduce bitter pit.

When selecting a calcium spray product the amount of actual calcium that will be applied to the fruit is more important than the formula it comes in. When selecting a product, growers should be looking at the amount of actual calcium that will be applied with each foliar application and its cost per kg. Calcium chloride flake is the most economical product in the marketplace. Calcium nitrate is another economical source of calcium however 1.6 times as much calcium nitrate has to be applied to be equivalent to a calcium chloride spray. The nitrogen in calcium nitrate is not readily absorbed by the leaf tissue, but

some nitrogen will be added to the orchard and the use of this product should be avoided in orchards that have a high nitrogen level. In some growing regions calcium nitrate is recommended at the start of the calcium spray season with a couple of calcium nitrate sprays and then switch to calcium chloride for the remainder of the season. This is done to reduce the risk of problems related to high levels of nitrogen late in the growing season.

The start of a calcium spray program will depend on the amount of calcium that has to be applied. Sprays can begin as soon as a couple of weeks after petal fall and repeated every two to three weeks until harvest, or left until a month prior to harvest where only a couple of applications are required. Sprays applied later in the growing season will add more calcium than early season applications as the fruit is larger and more spray will be deposited on this larger fruit. The spray has to be deposited on the fruit to be effective. The amount of calcium you are able to apply with each application will also have some bearing on the number of sprays applied. The use of dilute sprays will allow for the maximum amount of calcium to be applied with each spray, however, this is not realistic for most producers who are applying calcium with their fungicide application in a concentrated form. Once calcium is applied in a concentrate spray the amount of calcium applied on a per hectare basis is reduced to avoid damage to the fruit and foliage. The recommended rate of calcium chloride (77-80% flake) is 4.5 kg/1000 L or 15 kg/ha, while the rate for calcium nitrate is 6 kg/1000 L or 20 kg/ha applied as dilute spray. The safety of concentrated sprays depends on uniformity of spray pattern and spray deposit. In order to prevent potential problems reducing rates by half has proven to be safe. In some growing regions they recommend a lower rate of calcium early in the growing season such as 1.5 to 2.5 kg of calcium chloride per 1000 L and 3.4 to 4.5 kg/1000 L during the second half of the season. Calcium should not be applied when temperatures are above 26°C particularly under high humidity. Repeated applications under dry weather conditions can also lead to problems. Without rain, calcium chloride can build up on the fruit and leaves, which may result in damage. Just to sum things up it's not the formulation of calcium you use but the amount of calcium that is applied that will have the most benefit on fruit quality.

Migrant Labour Information Session

The NSFGA will be holding a “**Migrant Labour Information Session**” on July 17, 2003 at 7:30 pm in the Cornwallis Room at the Kentville Agricultural Centre. The following guests have volunteered to attend and make short presentations:

- Mr. Jerome Davis, Consulate of Barbados
- Mr. Dicks, HRDC, Maritime Regional Manager
- Fundy Travel
- Representative from the Dept. of Health

HRDC has created the policy for this program and feels that a 'case' has to be made by the apple growers to show a requirement for migrant labour. Your attendance at this session is strongly encouraged. Please give some thought to the possibility of implementing this program in your operation and come with some thought provoking questions and some examples of labour shortages/problems you may have experienced.

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