

Tree Fruit Mites

European Red, Rust and Spider Mites

March, 2015

European Red Mite

Hosts

All tree fruits

Damage

Leaves - Speckled when lightly infested, bronzed when heavily infested.

Fruit - Size and colour may be affected if mites are numerous for a long period.

Identification

Egg - Red or orange, globular and slightly flattened on top, with a white stalk as long as the egg is wide.

Immature - Red, orange or green with 6 or 8 legs.

Adult female - Globular, reddish-brown with white spines arising from raised white spots on upper side.

Adult male - Light red or green with pointed abdomen.

Life History

Overwintering eggs occur in clusters on roughened areas of bark on twigs and smaller branches, often on the undersides of fruit spurs and at forks of small branches. Eggs hatch at the pink bud stage, and young mites feed upon the opening flowers and developing leaves. The mites continue to feed upon leaves during the spring and summer, increasing in numbers in response to warm temperatures. There may be as many as 6-7 generations per year. Populations generally decline by mid-August, and females lay overwintering eggs during August and September.



Apple leaves damaged by European red mite feeding (curled, pale green-bronzed leaves)



European red mite life stages.

Photo courtesy Agriculture & Agri-Food Canada

Monitoring

Dormant season (apple only) - Collect 5 fruit spurs per tree on 20 trees selected at random from each hectare of orchard. Count or estimate the number of eggs on the terminal 4-cm of each spur, starting at the base of the bud.

Summer - Monitoring is especially important if you apply Sevin thinning sprays and either Alias, Assail or Admire each season.

The combination of Sevin thinning sprays and more than one or more applications of any of Alias, Assail or Admire increases the risk of mite damage in the current or following year.

Examine leaves throughout the orchard to assess average numbers of active European red mites and predatory mites. Inspections every week or two are desirable to evaluate population trends and tree response. Numbers of both plant-feeding and predatory mites may be determined either by hand lens examination or through one of the mite counting services. Check with your crop management advisor for addresses of these monitoring services.



European red mite eggs

Control

Cultural - Healthy, well-maintained trees will tolerate higher mite populations than weak or stressed trees.

Biological - Several species of predatory insects and mites attack all stages of plant-feeding mites to keep populations below damaging levels in most tree fruits. Pear trees cannot tolerate high enough numbers of plant-feeding mites to support the predatory mites needed in integrated control. Chemicals applied for controlling other pests and diseases may upset the ratio of plant-feeding to predatory mites, reducing the effect of biological control. Therefore all pesticides and application rates recommended for integrated mite control in apple will conserve predatory mites.

Chemical - If predatory mites are present in apple and pear orchards and not exposed to harmful sprays (such as several Sevin thinning sprays), summer sprays of miticides are not usually necessary. No action threshold has been determined for European red mite on soft fruits except where noted below.

Pesticide resistance management - It is important to alternate products from different chemical classes or with different modes of action to avoid the development of resistance.

Early season - If an average of over 50 European red mite eggs per spur is present in the dormant sample, apply dormant oil during the 15 mm green-bud to tight-cluster bud stage. This spray is especially important to integrated control because it favours survival of predatory mites and apple rust mite. Oil has a physical effect on mite eggs. A physical control method is not susceptible to resistance development. A well-applied oil spray will keep European red mites at a low level until summer.

If the number of overwintering European red mite eggs is greater than 50 eggs per spur between petal fall and first cover, use one of the following miticides as per label instructions:

- Apollo on apple, nectarine, peach, and pear after bloom when adult mites first appear. Apollo is a specific miticide that acts primarily on mite eggs and has some effect on young mites but does not control adult mites. Apollo does not harm predatory mites, bees or beneficial insects. Do not apply Apollo more than once per season.
- Agri-Mek plus 0.25% oil before there are 5 mites per leaf on apple and before 2 mites per leaf on pear. Do not apply more than once per season on apple or more than twice per season on pear. Apply Agri-Mek with 0.25% oil to improve absorption of the chemical into the leaves and to increase the residual control of mites. Applications later in the season have shorter residual control as older leaves absorb less chemical. Agri-Mek plus oil treatment may cause russetting on thin-skinned apple varieties such as Golden Delicious and on d'Anjou pears. Use Agri-Mek in rotation with products with different modes of action to avoid development of pesticide resistance. Check the product label for additional precautions.
- Envidor 240 SC on all tree fruits except prunes and plums. Do not apply more than once per season nor within 7 days of harvest. Envidor controls all stages of European red mite and will also control any spider mites and rust mites present.
- Acramite 50WS on apple. Do not apply more than once per season nor within 7 days of harvest. Will also control any spider mites present.
- Kanemite 15 SC on apple and pear. Do not apply more than once per season nor within 14 days of harvest. Will also control any two-spotted spider mites present.
- Nealta on apple and pear. Nealta controls all life stages of European red mites and will also control any spider mites present. Do not apply more than two times per season nor within 7 days of harvest.

Summer - See the precaution under Monitoring above regarding impact Sevin thinning sprays and use of Alias, Assail and/or Admire on apple. Control of European red mite on apple is only necessary if a leaf examination of trees throughout the orchard, or in a problem area, shows that there is an average of more than 15 active red mites per leaf and more than 10 red mites for each predatory mite. After mid-July, European red mite levels can reach 30-50 or more per leaf, particularly on vigorous trees, before spraying is necessary. At these levels, some leaf mottling or bronzing may occur but will not affect fruit size and colour and next year's crop.

Recommended summer sprays are:

- Acramite on apple;
- Envidor on all tree fruits except prunes and plums;
- Nexter on apple, pear, sweet and sour cherries;
- Agri-Mek plus 0.25% oil on apple and pear (see above);
- Carzol on peach when a threshold of 5-10 mites per leaf is present and most of the mites are young;
- Kanemite on apple and pear;
- Nealta on apple and pear;
- Purespay Green Spray Oil 13E on apple and pear for suppression only.

Envidor, Pyramite, Agri-Mek, Purespay Green Spray Oil 13E, Nealta are satisfactory for integrated control as they do not eliminate predatory mites. Do not use Envidor or Carzol more than once per season. Avoid use of Carzol as it is harmful to predatory mites and insects.

Rust Mites (Apple, Pear, and Pearleaf blister)

Host

Apple is the only host for apple rust mite, pear for pear rust mite; pearleaf blister mite attacks pear and some varieties of apples (Newtown, Rome Beauty, sometimes McIntosh and Spartan) as well as several ornamental trees and shrubs.

Damage

Apple rust mite - Reddening of margins and upward cupping of leaves followed by bronzing or silvering with high populations.

Pear rust mite - Smooth russeting on leaves and fruit (Fig. 5).

Pearleaf blister mite - Reddish russet spots and deformity of fruit.



Rust mite damage to apple leaves and fruits



Pear rust mite damage to fruit

Identification

Eggs - Round and translucent.

Immature and adult - Tan, wedge-shaped, less than 0.2mm long.

Life History

Rust mites overwinter at the base of buds, under bud scales and leaf scars, or in bark crevices on branches and twigs. When the buds open, mites move to the flower parts and leaves. At a base temperature of 6°C, 50% of pear rust mites will have emerged at 60 degree-days from January 1. Around petal-fall, pear rust mites and pearleaf blister mites move onto fruit. Rust mites produce several generations during the spring and summer. Apple rust mite populations usually decline in hot weather. Overwintering forms of pear rust mite appear in late July and move to overwintering sites on the tree.

Monitoring

No monitoring plan has been developed for pearleaf blister mite. For apple rust mite, follow the sampling plan described for summer monitoring of European red mite. For pear rust mite, begin examining the stem end of 20 fruit per block at calyx for mites. Continue monitoring until mid-August.



Pearleaf blister mite damage



Pearleaf blister mite damage to apple leaves
Photo courtesy Agriculture & Agri-Food Canada

Control

Cultural - Healthy, well-maintained trees will tolerate higher mite populations than weak or stressed trees. Winter pruning will remove many overwintering rust mites.

Biological - Conservation of moderate numbers of apple rust mite is important. This mite serves as a valuable food source for predatory mites, allowing their survival early in the season so that they are available when needed to control European red mite. Consider a spray only when apple rust mites reach an average of 300-600 per leaf. 600 mites per leaf may cause little damage. Based on field observations, use the action threshold of 200 rust mites per leaf for Jonagold and Braeburn and in some cases Fuji and Gala. Base the final decision to spray on visible leaf damage. Unnecessary sprays can destroy rust mites resulting in the disappearance of predatory mites and a buildup of spider mites (two spotted, McDaniel spider mites or European red mites).

Predatory mites are usually not numerous enough in pear trees to keep pear rust mites below damaging levels.

Chemical

- **Apple rust mite** - Use Envidor (maximum once per season) or Nexter (maximum of 2 applications per season) to control economic populations.
- **Pear rust mite** - Apply a miticide if an average of one rust mite per fruit is found. Dormant and pink sprays applied for pear psylla control will suppress pear rust mite. Apply Envidor (maximum once per season), Kumulus, Nexter or Agri-Mek with oil (see discussion of Agri-Mek under European red mite). Do not apply Kumulus to Anjou pear.
- **Pearleaf blister mite** - If damage was evident on fruit last year, apply a dormant spray of lime-sulphur.

Pesticide resistance management - It is important to alternate products from different chemical classes or with different modes of action to avoid the development of resistance.

Spider Mites (McDaniel, Twospotted)

Hosts

McDaniel - Apple, rarely on other fruit trees.

Twospotted - Pear, stone fruits.

Damage

Leaves - For apple and stone fruits, speckled when lightly infested; bronzed and covered with webbing when heavily infested; injured leaves may fall. For pear, leaves turn black and drop off.

Fruit - Size, colour and subsequent fruit set of apple and pear may be affected if mites are numerous for a long period; little effect upon mature stone fruit.



*Life stages of McDaniel spider mite
Photo courtesy Agriculture & Agri-Food Canada*

Identification

Egg - Spherical, translucent to opaque.

Immature - Similar to adults but often lacking black spots, initially with six legs, later with eight.

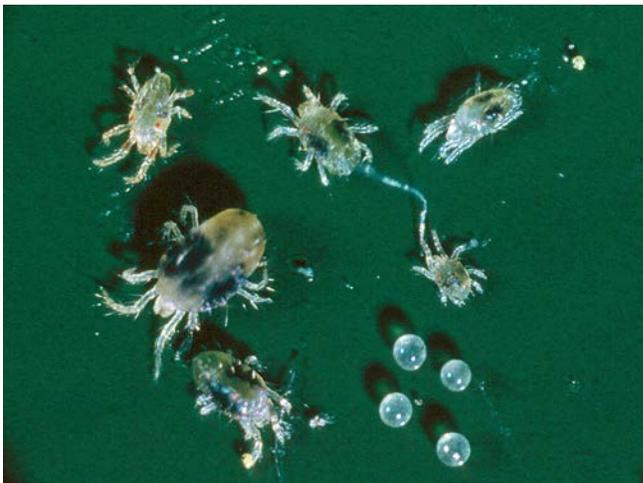
Adult female - Oval, with eight legs, red or orange in winter, yellow to green in summer with two black spots on each side. McDaniel has additional smaller black spots toward the rear.

Adult male - Smaller than female, abdomen narrows toward rear.



Overwintering reddish-coloured female McDaniel spider mites

Photo courtesy Agriculture & Agri-Food Canada



Life stages of the twospotted spider mite

Photo courtesy Agriculture & Agri-Food Canada

Life History

Red to orange-coloured adult females overwinter beneath bark or in trash at the base of trees. In early spring they move up the tree trunk to leaves near the main limbs. They spread throughout the tree and produce several generations depending on temperature. Overwintering females appear in September.

Monitoring

Examine leaves throughout the orchard to assess average numbers of active spider mites and predatory mites. Inspections every week or two are desirable to evaluate population trends and tree response. Numbers of both plant-feeding and predatory mites may be determined either by hand lens examination or through one of the mite counting services.

Control

Cultural - Healthy, well-maintained trees will tolerate higher mite populations than weak or stressed trees.

Biological - Apple trees can tolerate the moderate numbers of spider mites that normally occur when predatory mites and insects are present. Pear cannot tolerate the level of spider mites needed to support populations of predatory mites. Chemicals applied for controlling other pests and diseases on apple may upset the ratio of plant-feeding to predatory mites, reducing the effect of biological control. Therefore all pesticides and application rates recommended in the apple pest control program are selected to conserve predatory mites.

Chemical - Chemical control on apple is not required if predatory mites are present to keep McDaniel and twospotted spider mites at low to moderate levels. See chemical control of European red mite for recommended summer sprays if required to control spider mites.

Because pear is more susceptible to spider mite damage, early detection and control is often necessary to prevent losses. A petal-fall application of Apollo will provide season-long control. Apply when mite populations are mainly in the egg stage and there are fewer than 3 mites per leaf. Summer sprays of Carzol will control all plant-feeding mites on pears except rust mites. However, Carzol is disruptive to integrated pest management of pear psylla. As an alternative, Envidor, Nexter or Nealta may be used. Envidor controls all stages of spider mites and also controls any pear rust mite present. Do not apply more than once per season. Kanemite will control all stages of spider mites. Apply Kanemite before economic thresholds are reached. Nealta will control all life stages of spider mites. Do not apply more than 2 times per season.

Pesticide resistance management - It is important to alternate products from different chemical classes or with different modes of action to avoid the development of resistance. Consult the Chemical Classification & Pesticide Resistance Management table in the [*Tree Fruit Production Guide*](#) to select miticides with different chemical class group numbers to rotate as part of a resistance management program.