

## Mites (*Acarina*)

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Three species of pest mites occur in Minnesota apple orchards: **European red mite**, **twospotted spider mite**, and **apple rust mite**.

Mites are minute and barely visible to the unaided eye. Unlike insects, the abdomen is not divided into segments. Mites can reproduce very quickly, producing several generations per year.

### European Red Mite (*Panonychus ulmi*)

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**European red mite** (ERM) is an introduced mite from Europe, and the most important pest mite in Minnesota orchards. It also feeds on the foliage of other fruit trees.

**Adult female ERM** is brick red to brownish-red, globular, with white spots at the bases of its white bristles (long, thick hair-like structures). Body length is about 0.4 mm. **Males** are lighter (reddish-yellow), smaller (0.28 mm long), with a pointed abdomen and longer legs. ERM occurs in the orchard from spring to harvest.

Picture source: UC



*Adult ERM*



*ERM eggs*

**Eggs** laid in the spring and summer are bright red to dark orange, globular, somewhat flattened (onion-shaped), and about 0.13 mm in diameter.

ERM overwinter as fertilized eggs deposited in groups on roughened bark areas around the base of buds and fruit spurs. Overwintering eggs are deeper red, producing a reddish cast on infested areas. Overwintered eggs start to hatch in the spring around tight cluster stage of apple.

ERM pass through three immature stages (larva, protonymph and deutonymph). The immature stages feed in clusters in leaves. ERM prefer to feed on the lower leaf surface, although both the upper and lower surfaces of the leaf are fed upon during severe infestations.

### Twospotted Spider Mite (*Tetranychus urticae*)

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**Twospotted spider mites** (TSSM) are referred to as spider mites because of the webs they make on the underside of leaves. TSSM overwinter as adult females in protected areas on the ground. TSSM can occur in the orchard from tight cluster to harvest.

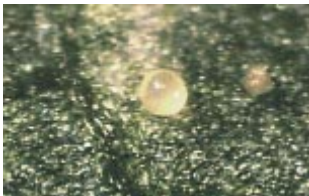
Picture source: MSU



*Adult TSSM*

**Adult female** TSSM is straw yellow to green, oval, about 0.65 mm long. They have two characteristic lateral black spots behind the eyes. **Males** are slightly smaller, and have a narrower, pointed abdomen.

**Eggs** are spherical, translucent (becoming opaque just before hatching) and are sometimes laid among webbing.



*TSSM egg*

TSSM **nymphs** can vary in color, but are normally pale yellow, pale green, or straw-colored, with two characteristic green spots. The end of the abdomen is generally dark green. The first nymphal stage (larva) is six-legged, whereas the later protonymph and deutonymph stages are eight-legged.

Leaves infested by TSSM show a distinct spotted effect called stippling. At high populations, TSSM spin webs over leaves and twigs.

Picture source: UC



*Webbing by spider mite*

## Apple Rust Mite (*Aculus schlechtendali*)

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Picture source: MSU



*ARM*

**Apple rust mite** (ARM) is the smallest of the three orchard pest mites, and can only be seen with the aid of a hand lens. Adult females overwinter beneath bud scales and bark.

**Adult** ARM is tan to cream-colored, elongated, triangular and has only two pairs of legs. Body length is about 0.2 mm. ARM can occur in the orchard from tight cluster to harvest.

Picture source: MSU



*Rust mite feeding damage*

**Injury** from pest mites is caused by the piercing of the cell walls by the bristle-like mouthparts and the ingestion of cell contents. Feeding injury results in off-color or brown foliage that will look bronzed in a heavy infestation. Severe spring feeding can affect fruit bud formation and reduce yields the following year. ARM feeding on fruit can cause russetting.

	<b>ERM</b>	<b>TSSM</b>	<b>ARM</b>
<b>Female color</b>	Red to brownish-red	Pale yellow to green	Tan to cream
<b>Female length</b>	0.4mm	0.65 mm	0.2mm
<b>Shape</b>	Globular or round	Oval	Elongate, triangular
<b>Distinguishing marks</b>	White spots at the base of white bristles (setae)	Two distinct spots behind the eyes; web spinning	Only two pairs of legs; others have four pairs
<b>Over-wintering stage</b>	Fertilized eggs	Adult females	Adult females

***Distinguishing between common apple pest mites***

Refer to the *IPM Management Manual for Minnesota Apple Orchards* for information on mite sampling, thresholds, and management options.