

European red mite

Panonychus ulmi (Koch)



INTRODUCTION

The European red mite (ERM) is a European species introduced to North America in the early 1900's. It rapidly extended its range, and is now established in most deciduous fruit growing areas. It is the most important mite species attacking tree fruits in North America. ERM can also be a pest of grapes and raspberries.

THE ADULTS

There are 4-9 generations of the ERM a year, depending on the locality and the length of the growing season. The sexes of the adults are readily differentiated. The female (Fig. 1) has a globular body which ranges in length from .38-.40 mm, is velvety brown to brick red, and has 4 rows of dorsal setae or spines borne on raised white tubercles. The body color and setal pattern distinguish this species from all other plant feeding mites.

The male is smaller, .26-.28 mm in length, lighter in color and has a pointed abdomen and proportionately longer legs (Fig. 2).

The rate of development is temperature dependent, being slower in the spring and fall, and more rapid during the hot summer months. The first generation generally requires about 3 weeks to develop, while summer generations may develop in 10 to 14 days. Reproduction can be both sexual and parthenogenetic. Unfertilized eggs give rise to males only, while mated females produce both sexes.

The average preoviposition period of females is about 2 1/2 days. Although some females in insectary studies have lived 39 days, the average life span is 18 days. The oviposition period averages 12.5 days with 18.8 eggs produced per female.

THE EGGS

The ERM overwinters as fertilized eggs. The environmental factors triggering winter egg production are diminishing food supply, temperature and photoperiod. The bulk of winter egg deposition occurs from mid to late August, but may continue until late September. Overwintering eggs (Fig. 3) are deposited in groups, on roughened bark areas, especially around the base of buds and fruit spurs. These eggs may be so numerous that the infested areas take on a reddish cast. Egg hatch is closely correlated with bud development and first occurs when buds are in the tight cluster stage; hatch is better than 50% complete at the pink stage, and virtually 100% complete by the end of bloom. The first summer eggs as a rule can be found at petal fall or at latest by fruit set.

The summer eggs are globular and somewhat flattened (onion shaped) (Fig. 4). They are bright red to dark orange, and average .13 mm in diameter. The overwintering egg is deeper red and slightly larger, averaging .14 mm. The egg surface is ridged with the grooves running toward the top center from which a slender tapering stalk (.1 mm) arises.

The average incubation period of the summer eggs for each generation varies from 6.7 to 14.4 days, the shortest period being in mid-summer.

THE LARVAE AND NYMPHS

The ERM passes through 3 stages between egg hatch and adulthood. They are called the larva, protonymph and deutonymph. A quiescent or resting period precedes each molt to the following stage. The hatching larva is about .2 mm in length, light orange in color and 6 legged. All subsequent stages have 8 legs. With the exceptions of an increase in size and the ability to differentiate sexes in the deutonymphal stage, there are no conspicuous changes in structure or color between the nymphal instars. The average developmental time from eclosion to adulthood ranges from 5.5-15 days, depending on the generation.

INJURY

Although a pest of all tree fruits, apple and plum suffer most severely. Injury is caused by the feeding of all stages on the foliage. The lower leaf surface is preferred. Under high populations both surfaces are fed upon. The injury is caused by the piercing of the cell walls by the bristle-like mouthparts and the ingestion of their contents, including the chlorophyll. The injury results in off-color foliage which in severe cases becomes bronzed (Fig. 5a) as compared to

uninfested foliage (Fig. 5b). The leaf efficiency and productivity is directly affected. Heavy mite feeding early in the season (late June and early July) not only can reduce tree growth and yield but also drastically affect fruit bud formation, and thereby reduce yields the following year. Additionally, mite injured leaves will not respond to growth regulators applied to delay harvest drop.

CONTROL

Mite predators are generally distributed in commercial apple plantings and contribute to the control of the ERM and should be protected. The ERM can be readily controlled by thorough and timely acaricide applications. The most effective treatments are those applied after new growth has appeared but ahead of bloom. Seasonal control can often be obtained with a single petroleum oil spray directed against the overwintering eggs or the application of an acaricide toxic to the newly hatched forms. Against established populations in the summer it is often necessary to make 2 applications 10-14 days apart. Consult your local recommendations for timing and best materials to use in your area.