

Biology/Phenology

Association of Spider Mites and Powdery Mildew in Apple

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Knowledge of interactions among pests is important for developing ecosystem based pest management programs. Tetranychid mites and phytopathogenic fungi are common pests in agroecosystems. Spider mites (*Tetranychus urticae* [Koch] and *T. mcdanieli* [McGregor]) and powdery mildew (*Podosphaera leucotricha* [Ell. & Evherh.] E. S. Salmon) are common pests of apples in the western United States. We documented an association between spider mites (*T. urticae* and *T. mcdanieli*) and powdery mildew (*P. clandestina*) on sour cherry. Observations in the field suggested that a similar association occurred on apple. In 1998, we surveyed apple leaves with and without mildew for the presence of spider mites in three apple orchards in northern Utah.

**Material and Methods**

We surveyed three apple orchards in northern Utah (Payson, Santaquin, and Spanish Fork) in 1998. Sixty leaves of each type (with mildew and without mildew) were collected from each orchard and one leaf of each type (mildew infested and no mildew) was collected from each tree sampled. In the Payson orchard on 17 August, 10 mildew infested leaves and 10 leaves without mildew were collected from each of 10 trees, and within trees each leaf was collected from a different terminal. The fourth leaf from the distal end of terminals was used so leaf age was similar. The orchards were sampled 2 or 4 times during the summer.

**Results**

*T. urticae* and *T. mcdanieli* were found in the samples. In the Payson orchard on 14 July and 4 and 17 August and the Santaquin orchard on 4 August, higher densities of each spider mite life stage (adult, immature, egg, and all stages combined) occurred on the leaves with mildew than leaves without mildew ( $P \leq 0.05$ ). A higher percentage of leaves with mildew was infested with each stage of spider mite in the Payson orchard on 14 July and 4 August (adult, immature, egg, and all stages combined) and on 17 August (immature, egg, and all stages combined) ( $P \leq 0.05$ ). No differences occurred in percentage of leaves infested in the Santaquin orchard. Spider mite densities were very low in the Spanish Fork orchard and no significant differences occurred in densities or percentage of leaves infested.