2-17. Stage-Structured Population Dynamic Model of Korean Twospotted Spider Mite

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Reliable prediction of population growth that is approaching a threshold in a short time period plays a critical role in decision making for deploying pest management tactics. For this purpose, a stage-structured simulation model was constructed to predict the population dynamics of twospotted spider mite (*Tetranychus urticae* Koch) in Korean apple and pear orchards. Three main factors influential to spider mite population dynamic in Korean orchard systems are temperature, pesticide and precipitation. Temperature-dependent developmental parameters were mainly derived from experimental measures with a Korean strain of twospotted spider mite. Mean developmental rates and adult longevity were treated with the poikilotherm rate function with daily mean temperature while its variation, age-specific fecundity and mortality were described as a Weibull function after transformation into physiological age. Contact and residue toxicity data were integrated into an exponential decay function to represent the field behavior of pesticide-spider mite interaction. Precipitation effect on twospotted spider mite population was similarly treated with an exponential decay function. Population dynamics from simulations were well compared to that observed from greenhouse and orchards (apple and pear). Some aberrant behaviors of the model output and factors needing improvement are further discussed.