

**Biological control of twospotted spider mites, *Tetranychus urticae* Koch (Acari: Tetranychidae), using *Phytoseiulus persimilis* Athias-Henriot (Acari: Phytoseiidae) on impatiens**

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**ABSTRACT**

The effectiveness of the predatory mite, *Phytoseiulus persimilis* Athias-Henriot (Acari: Phytoseiidae), as a suppressive agent of the twospotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae), was evaluated on impatiens plants at predator:prey release ratios of 1:3 (high), 1:15 (medium) and 1:30 (low). Releases at each ratio were made at low and high initial *T. urticae* densities to determine if initial pest population size influenced the suppressive ability of the predator. After only one week, *P. persimilis* was reduced both the higher and lower *T. urticae* populations to negligible levels and kept damage to 5% or less, but only at the 1:3 ratio. At the medium predator:prey ratio, predators prevented spider mite numbers and damage from increasing, but did not reduce either. At the lowest ratio (1:30) spider mite populations and plant damage continued to increase. Both the medium and low ratios allowed unacceptably high levels of plant damage. A regression model indicated that a release ratio of 1:10 or higher should consistently reduce the pest population and associated damage to acceptable levels. However, if spider mites establish at high levels of infestation similar to those we tested experimentally, even releasing predators at a 1:3 ratio will not provide certain control. To reliably control damage from spider mites on impatiens, predators must be released as soon as spider mites are detected in order to reduce spider mite populations to non-detectable levels within one or two weeks of predator release.

**Key Words:** Predator-prey ratios, augmentative biological control, greenhouse crops