



Standard Specification for *Phytoseiulus persimilis* Athias-Henriot (Acarina:Phytoseiidae)¹

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1. Scope

1.1 This specification covers information on and two test methods for quantification of commercial shipments of the predatory mite, *Phytoseiulus persimilis* Athias-Henriot (Acarina:Phytoseiidae), predator of the two-spotted spider mite, *Tetranychus urticae* Koch.²

2. Referenced Documents

2.1 ASTM Standards:

E 2200 Specification for Information Included With Packaging of Multi-cellular Biological Control Organisms³

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *carrier*—vermiculite, corn grits, wood shavings, or bean leaves.

3.1.2 *life stage when shipped*—adults and immature.

3.1.3 *name of product*—*Phytoseiulus persimilis* Athias-Henriot

3.1.4 *preferred host prey*—two-spotted spider mite, *Tetranychus urticae* Koch

4. Classification

4.1 *Phylum*—Arthropoda.

4.2 *Class*—Arachnida.

4.3 *Order*—Acarina.

4.4 *Family*—Phytoseiidae.

4.5 *Genus*—*Phytoseiulus*.

4.6 *Species*—*persimilis*.

5. Summary of Test Methods

5.1 Test Method A describes a counting method for live *P. persimilis* shipped on vermiculite, corn grits, or wood shavings carrier. Test Method B describes a counting method for live *P. persimilis* per container supplied on bean leaves.

5.2 Number of living *P. persimilis* will be determined by sampling individual containers with *P. persimilis* and estimating total number of live *P. persimilis* and 95 % confidence limits (C.L.) per container. In each container, possible live contaminants will be identified and recorded.

6. Significance and Use

6.1 The efficacy of two-spotted spider mite control by *P. persimilis* depends on accurate release rates of this predator. Accurate packaging and maintenance of viability and purity of *P. persimilis* shipments are, therefore, essential for the effective management of this pest. This test method will be typically employed by producers and users of the product to assess the number of live biological control agents delivered.

TEST METHOD A—Determining the Number of *P. persimilis* per Container Supplied on a Bulk Carrier

7. Materials

7.1 Dissecting microscope or magnifier (10 $\times$), non-toxic white glue or dish detergent, light source, scale (0.00 gr min), mixing container.

8. Test Unit

8.1 A single container with *P. persimilis* is considered a test unit. Minimum three containers per shipment should be chosen randomly from the shipping box.

9. Pre-Test Conditions

9.1 Store the containers with *P. persimilis* between 10 and 12°C, RH 60 $\pm$ 5 %, for a minimum of 1 h and maximum of 24 h prior to examination.

10. Mixing and Weight Recording

10.1 Record the weight of the container with predators. Rotate the contents of the container gently until all predators are removed from the container wall and mixed well with carrier. Pour half of the carrier with predators into a mixing container. Mixing container should be about 4 times larger than container with *P. persimilis*. Mix the remaining contents for a few seconds and empty into the mixing container. Rotate carrier with predators gently for about 15 s so that carrier always touches container walls. Record the weight of empty container and determine total weight of carrier and predators.

¹ This specification is under the jurisdiction of ASTM Committee E35 on Pesticides and Alternative Control Agents and are the direct responsibility of Subcommittee E35.30 on Natural Multi-Cellular (Metazoan) Biological Control Organisms.

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² Steinberg, S., and Dale, J., "Designing and Implementing Quality Control of Beneficial Insects: Towards More Reliable Biological Pest Control," Sting, Newsletter on Biological Control in Greenhouses, No. 18, July 1998, pp. 26-27.

³ Annual Book of ASTM Standards, Vol 11.05.