Case Definition

Tropilaelaps Infestation of Honey Bees

(Notifiable)

December 2023

1. **Disease Information**
   - **1.1 General Disease and Pathogen Information:** *Tropilaelaps* mites (including *T. clareae*, *T. koenigerum*, *T. thaii* and *T. mercedesae*) are ectoparasites of honey bee (*Apis*) species. Each *Tropilaelaps* species has a different geographic range, but they are all native to Asia. *Tropilaelaps* have expanded host use to include *Apis mellifera* honey bees. *T. clareae* and *T. mercedesae* are the most threatening to *A. mellifera* colonies. Due to this, and other reasons, the geographic ranges of these two species are expanding. The mites feed on bee larvae and pupae causing brood malformation, nutrient deprivation, and death of bees. Mites can transmit pathogenic honey bee viral diseases. Infestations subsequently lead to colony decline or absconding. *Tropilaelaps* mites may co-occur with *Varroa* mites in *A. mellifera* colonies. Because a *Tropilaelaps* infestation has not yet been detected in a honey bee hive in the United States, it is considered a Foreign Animal Disease (FAD).
   - **1.2 Clinical Signs:** Clinical signs of *Tropilaelaps* infestation in a hive resemble those of other parasitic infestations (e.g., Varroosis), including weak adult bees with shrunken and deformed wings and legs, and/or deformed abdomens, bees crawling (rather than flying) near the entrance of a hive, reduced lifespan of adult bees, brood cappings with small holes where worker bees attempted to remove dead brood, spotty brood patterns or dead brood that may smell of decay, and overall colony decline. Mites may also be seen with the naked eye on adult bees or brood. Early signs of *Tropilaelaps* infestation may go unnoticed, but due to the mites' short lifecycle (about one week), mite population growth is rapid and quickly causes colony decline and high hive mortality.
2. **Laboratory Criteria**
   - **2.1 Agent Isolation and Identification:** A "bump" test of a brood frame or sticky board placement under hive frames, especially when combined with acaricide use, are successful methods to dislodge and collect mites. Mites may also be isolated by submerging a sample of bees in alcohol, soapy water or powdered sugar then straining out the bees and allowing the mites to be collected and counted. However, *Tropilaelaps* spend relatively little time on adult bees, and are predominantly found in brood cells, making it difficult to gauge the degree of infestation using the above methods. Uncapping both drone and worker brood to examine the brood for mites aids in detection and helps indicate the extent of an infestation. *Tropilaelaps* can be identified by morphological methods using microscopy. Young mites are whitish, while adult mites are reddish-brown, 0.6-1 mm in size and have a narrow, elongated shape. *Tropilaelaps* are fast-moving mites with relatively long legs. These traits help distinguish them from the *Varroa destructor* mite, which is rounder, has shorter legs and is slower moving. Mites should be collected and sent to a laboratory for full

identification. Any suspected *Tropilaelaps* specimens submitted to a laboratory should arrive dead (in 70% ethanol or having been stored overnight at -20º C).

2.2 Agent Characterization: If available, laboratory identification of the mite may also involve a combination of polymerase chain reaction (PCR) and sequencing for molecular identification to differentiate between *Tropilaelaps* species and the many morphologically similar mites.

2.3 Serology: NA.

3. **Case Definition and Reporting Criteria**

3.1 Suspect Case: Clinical signs, history, or epidemiology consistent with *Tropilaelaps* infestation in a susceptible honey bee hive.

3.2 Presumptive Positive Case: A hive from which *Tropilaelaps* mites have been identified at a non-designated laboratory.

3.3 Confirmed Positive Case: A hive from which *Tropilaelaps* mites have been identified at a laboratory designated by APHIS Plant Protection and Quarantine.

4. **Reporting Criteria:** Tropilaelaps is a U.S. notifiable condition that is reportable immediately under the APHIS National List of Reportable Animal Diseases (NLRAD).

4.1 NLRAD reporting in accordance with the NLRAD Standards for notifiable diseases; and by APHIS to the World Organisation for Animal Health (WOAH).