Case Definition

Small Hive Beetle Infestation (SHB)
(Monitored)

December 2023

1. **Disease Information**
   - **1.1 General Disease and Pathogen Information:** *Aethina tumida*, the small hive beetle (SHB), is a parasite of honey bee hives. Adult beetles and larvae feed on honey bee brood, honey, and pollen before leaving the hive to pupate in the surrounding soil. The beetle is native to Africa, but was introduced to the US, Egypt, Canada, and Australia by commercial movement of bees. SHB requires warm and humid environments to complete its lifecycle and is generally more of a pest in southern states. Incidental observations in colonies in northern states are mostly due to movement of honey bee colonies from southern states. SHB infestation can lead to destruction of combs, colony abandonment, and economic losses. SHB tend to reach high infestations in colonies weakened by other parasites or pathogens. SHB damage may also occur if beekeepers do not remove hive boxes when bee populations experience regular seasonal declines and there aren't enough bees to protect colony resources.
   - **1.2 Clinical Signs:** The first sign of infestation is the visualization of dark brown to black beetles that are approximately 5 mm long and 3 mm wide in brood cells, on the bottom board, or on the inner cover. Adult beetles may be tolerated by the bees. Larvae are the most damaging life stage of SHB. SHB eggs are small, white, and are deposited in clutches around cracks, on the bottom board, or on the combs and under the caps of sealed brood. The larvae are white, up to 1 cm in length and have three pairs of legs and dorsal spikes. Larval infestation is associated with a rotten smell due to the death of honey bee brood or the fermentation of stored honey by a symbiotic fungus specific to SHB. Combs will have a wet or slimy appearance with fermented honey possibly dripping from the comb. In severe infestations, this liquid may pour from the colony entrance.
2. **Laboratory Criteria**
   - **2.1 Agent Isolation and Identification:** Infestation with the small hive beetle can be determined indirectly from colony-wide damage associated with the beetle or directly via visualization of eggs, larvae and adults with taxonomic identification. Adult beetles can be collected by hand, with forceps, or aspirator, while larvae can be collected with forceps. Molecular identification methods can also be utilized such as real-time polymerase chain reaction (PCR).
   - **2.2 Agent Characterization:** Partial and whole genome sequencing are recommended for characterization.
   - **2.3 Serology:** NA.

3. **Case Classification**
   - **3.1 Suspect Case:** bees with:
     - **3.1.1** consistent clinical signs; **OR**
     - **3.1.2** an epidemiologic link to a confirmed case.
   - **3.2 Presumptive Positive Case:** a hive experiencing colony decline and mortality while waiting for positive identification of the mite.
   - **3.3 Confirmed Positive Case:** a suspect case with
     - **3.3.1** taxonomic identification of SHB samples collected from the affected hive; **OR**
     - **3.3.2** positive PCR results.
4. **Reporting Criteria:** Small hive beetle infestation is a U.S. monitored condition that is reportable monthly under the APHIS National List of Reportable Animal Diseases (NLRAD).
   - **4.1** NLRAD reporting in accordance with the NLRAD Standards for monitored diseases; and by APHIS to the World Organisation for Animal Health (WOAH).