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A Risk Assessment for the Small Hive Beetle Based on Meteorological Standard Measurements

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Abstract : The Small Hive Beetle, Aethina tumida (Coleoptera: Nitidulidae) is a parasite for honey bee colonies, Apis mellifera, and was recently introduced to the European continent, accidentally. Based on the literature, a model was developed by using regional meteorological variables (daily values of minimum, maximum and mean air temperature as well as mean soil temperature at 50 mm depth) to calculate the time-point of hive invasion by A. tumida in springtime, the development duration of pupae as well as the number of generations of A. tumida per year. Luxembourg was used as a test region for our model for 2005 to 2013. The model output indicates a successful surviving of the Small Hive Beetle in Luxembourg with two up to three generations per year. Additionally, based on our meteorological data sets a first migration of SHB to apiaries can be expected from mid of March up to April. Our approach can be transferred easily to other countries to estimate the risk potential for a successful introduction and spreading of A. tumida in Western Europe.

Keywords : Aethina tumida, air temperature, larval development, soil temperature
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