

Approach

for the control and eradication
of the small hive beetle *Aethina tumida*
in Germany



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This approach was developed to prepare the authorities responsible for combating bee diseases as well as possible for an introduction of the pest into Germany. All proposed measures are subject to legal review. All stakeholders should seek a close and trusting cooperation and consider applying effective small hive beetle traps (you can find examples of these on the Web [here](#)) if necessary, and provide bee colonies for use as sentinel hives.

Eradication is possible only if infestation with *Aethina tumida* is detected at a very early stage and if the competent authority is notified immediately!

Procedure in case of suspicion of infestation

In accordance with the German Animal Health Law, any suspicion of infestation with the small hive beetle must be notified to the competent authority without delay.

Infestation is suspected as soon as eggs, larvae or adult beetles with features similar or identical to the morphological identification characteristics of small hive beetles are discovered in the beehive, at the apiary, or at the beekeeping operation (e.g. storage room, centrifuging chamber), or if examination of a debris¹-sample provides positive results.

The competent authority may consult bee inspectors to support the implementation of the preventive measures imposed and for sampling.

If the suspicion is substantiated, suspect eggs, larvae and/or beetles must be sent to the National Reference Laboratory at the Friedrich-Loeffler Institut for evaluation. Until evaluation is finalised, the suspect apiaries are subject to restriction measures imposed by the competent authority. Bee colonies and bees may not be removed from the location, and neither bees nor bee colonies may be transported to the location; this also applies to honeycombs, wax, unoccupied parts of the hive, and other equipment. The apiary may only be accessed by its owner and specially authorised persons (Section 17 of the German “Bienenseuchen-Verordnung” (= bee diseases act)).

If adult beetles are found and the competent authority can clearly identify the small hive beetle based on characteristic features (see here [“The small hive beetle”](#) - German only), the competent authority can impose preventive control or eradication measures prior to official clarification by the National Reference Laboratory (NRL) at the Friedrich-Loeffler Institut (FLI).

Procedure following official establishment of the infestation

Official confirmation of infestation with the small hive beetle must be given when eggs, larvae or adult beetles removed from the bee colony or apiary have been identified by the National Reference Laboratory.

¹All material originating from honey bee bodies or bee honeycombs that falls to the base of the hive is referred to as “debris”.

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Measures in the infested apiary and the surroundings

Infested apiaries shall be subject to a ban through notification by the competent authority according to Section 18 of the German “Bienen-seuchen-Verordnung”. The competent authority shall make infestation with the small hive beetle publicly known and report the case in the German [Animal Disease Reporting System \(TSN\)](#) without delay.

The competent authority shall declare the area within a radius of at least 10 km from the infested apiary as restriction zone.

All apiaries within a radius of at least 3 km shall be examined without delay; this also applies to storage locations, used or uninhabited hives and open-air honey bee museums with old hives.

When all apiaries within a radius of 3 km have been investigated, examinations shall be extended to a radius of 10 km from the affected apiary.

In the restriction zone, all apiary owners immediately must update the number and location of their bee colonies with the competent authority. The competent authority shall arrange examination of all bee colonies and apiaries (including empty beehives) inside the restriction zone for infestation with the small hive beetle in order to determine the extent of infestation as fast as possible. Bee colonies may not be removed from their location, and bee colonies may not be introduced into the restriction zone.

The area within a radius of 100 km from the infested apiary is declared as surveillance zone, so that it can be used as a reference for the internal EU trade certificate. In accordance with Part 2 of Annex E of

Directive 92/65/EEC in the respective valid version, the veterinary certificate for trade in bees and bumble bees certifies that the bees/bumble bees originate from a region with a radius of at least 100 km, which is not subject to any restrictions due to suspicion of the occurrence or confirmed occurrence of the small hive beetle and is not infested with this pest.

Any movements of bees within the surveillance zone must be registered with and notified to the competent authorities.

Epidemiological investigations

The competent authority conducts epidemiological investigations in order to clarify the cause of the introduction and identify a possible spread (Section 19 of the German “Bienen-seuchen-Verordnung”). Within the scope of the epidemiological examinations, it must also be clarified whether bees, bee brood, honeycombs, honeycomb parts, hive parts, wax or feed supplies have been moved to the infested apiary from a Member State of the EU or imported from a non-EU country. The control measures may differ depending on the result:

a) In case of initial introduction

If the epidemiological examinations to be conducted by the competent authority reveal that the confirmed infestation is the result of movements from another Member State or import from a non-EU country within the last year prior to confirmation, it can be assumed that it is an initial introduction. In this case, destruction of all bee colonies at the infested apiary must be ordered, except for the sentinel hives previously established.

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Depending on the apiary size and the setup of the colonies located there, at least one bee colony shall be used as a “beetle trap” (= sentinel hive) by the competent authority. Scientific studies in Australia have shown that some of the adult small hive beetles from an infested apiary remain outside of the colonies, especially at warm temperatures. As bee colonies are the major host for the small hive beetle it is crucial to set up sentinel hives in order to counteract further spread to attractive bee colonies in the surroundings.

Following destruction, all hives, frames, honeycombs, honeycomb parts, honeycomb waste, wax, feed supplies and all similar items which could have come into contact with the small hive beetle are destroyed (for example by burning) and all equipment cleaned

b) In case of non-initial introduction

If the epidemiological examinations reveal, that the confirmed infestation is the result neither of bee colony movements nor of import, or if no cause for the infestation can be determined, either destruction or treatment of all infested bee colonies can be ordered. Treatment of the affected apiary includes subsequent cleaning and decontamination including beehives, frames, honeycombs, honeycomb parts, honeycomb waste, wax, feed supplies and equipment.

Independently of the measures ordered by the authorities, at least one colony of the infested apiary shall be selected as sentinel hive, or, should this not be possible, sentinel hives shall be organized and established by the responsible authority.

Diagnostic process

Various diagnostic procedures can be applied in investigations to determine infestation. No procedure reliably detects infestation and initial experience in Italy has shown that the examination of entire bee populations (visual diagnosis) is indispensable. Although this is relatively time-consuming and requires knowledge of the probable location of the beetles in the bee population, it is the most reliable method.

For thorough visual diagnosis, the beehive should be placed next to its actual location and an empty hive box with bottom board should be placed at the actual location. First, remove the lid and examine thoroughly. Then, examine each honeycomb individually for adult small hive beetles and traces of damage, initially with bees and then again after the bees have been shaken off into the empty hive. After examination, place all honeycombs one after another into the hive box at its actual location. Finally, after all honeycombs have been examined and placed into the new hive, the original hive including its bottom board shall also be examined. Pay attention to robbery during the entire procedure and plan work if possible (e.g. schedule in the evening or take breaks).

Directly following visual diagnosis, small hive beetle traps should be installed, which must be examined at regular intervals and, if necessary, be replaced or cleaned.

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A debris examination in the laboratory using molecular biological methods is a very good possibility to examine bee colonies for a possible infestation with small hive beetles without too much time and effort at the apiary. This method can be applied in the restriction zone and in the surveillance zone. A positive result is initially only viewed as suspected infestation. In order to confirm the suspicion, the affected apiary must be visited and the bee colonies must be examined visually.

Control and diagnostic measures

a) At the infested apiary

If destruction of the entire bee population (except the sentinel hives) has been ordered, the hives must be closed in the evening and then the colonies must be killed. Afterwards, all hives, frames, honeycombs, honeycomb parts, honeycomb waste, wax, feed supplies and all similar items which could have come into contact with the small hive beetle are to be destroyed (for example by burning) and all equipment cleaned.

b) For the sentinel hives at the infested apiary

The sentinel hives are subject to surveillance by the competent authority and should be inspected and checked for infestation regularly (at least every 14 days). They must be equipped with traps between the frame top-bars and, if possible, with traps on the bottom board or sidewall (if bottom boards with Varroa grids or similar are used, the traps should be attached to an internal hive wall).

To date, no appropriate veterinary medicinal product for treatment has been approved in Germany. However, within the scope of reclassification according

to Section 56a of the German Medicinal Products Act (AMG), treatment with veterinary medicinal products approved in other EU member states is possible. Here, the provisions of Section 73 para. 3a AMG (including notification to the competent authority of purchase and prescription by veterinarians) must be observed.

In the USA, infestation with small hive beetles has been treated successfully with Checkmite+™ strips (active ingredient: coumaphos). This medicinal product is approved for the treatment of varroosis in some EU states (status March 2016: Bulgaria, Cyprus, Greece, Romania, Spain, Sweden, and Switzerland). Therefore, this medicinal product could also be used in Germany (subject to legal examination) in an emergency situation if no other possibilities for treatment exist within the scope of reclassification according to Section 56a of the German Medicinal Products Act (AMG) with official exemption approval.

However, application of the organophosphate coumaphos should remain clearly restricted to the phase of attempted eradication, as the incomplete efficacy of coumaphos traps does not justify the risk of resistance development and possible deposits in honey and wax in the case of long-term use.

If the sentinel hives cannot be selected from the existing bee population of the apiary and are instead provided by the competent authority, such sentinel hives could be prepared, for example local bee associations could equip them with efficient small hive beetle traps. This would also permit the immediate use of modified hive bottom boards with oil trays beneath the Varroa grid, which have shown good effectiveness without application of pharmaceuticals.

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c) In the restriction zone

All bee colonies must be equipped with traps between the frame top-bars and additionally, if possible, with traps on the bottom board or sidewall. All colonies must be examined visually and samples must be taken from all colonies for debris examinations in the laboratory.

d) Soil treatment at the infested apiary

The soil in the direct surroundings of infested beehives harbours the risk of reinfection due to the pupating small hive beetle larvae it may contain. Therefore, depending on the epidemiological situation, it must also be treated. The medicinal product used for treatment in the USA and Australia - the pyrethroid permethrin - has not been approved for soil treatment in Germany. Insecticides approved in Germany are the pyrethroids cypermethrin (e.g. against the pollen beetle) and deltamethrin (e.g. against leaf-eating beetles and storage pests). These insecticides are not specifically effective against the small hive beetle and the resulting environmental hazard always must be taken into consideration. Any use of pyrethroids for soil treatment should remain restricted to the eradication phase.

If eradication no longer appears possible, the soil surrounding the infested populations only needs to be treated if mass reproduction has taken place and thus it must be assumed that larvae or pupae are already in the soil. Vital bee colonies can normally prevent mass reproduction.

Repeal of the protective measures imposed

The protective measures imposed and notification of the case in the TSN are repealed when it has been ensured that the apiaries and food stock supplies are free from contamination by the small hive beetle. They are regarded as free of infestation when:

- all bee colonies from the concerned apiaries have perished, have been destroyed or treated,
- bees, bee brood, honeycombs, honeycomb parts and waste have been decontaminated or safely disposed of, and the food stock supplies as well as all parts of the hive and equipment have been cleaned and decontaminated under official surveillance,
- the soil on affected apiaries has been treated in accordance with the instructions of the competent authority,
- an examination three weeks after conclusion of treatment has provided negative results.

Sampling and shipping of suspect individuals

Sampling

Suspect developmental stages of small hive beetles (eggs, larvae and adult beetles) should be collected, if possible intact. For sample taking, please contact the competent authority. Sampling should take place in conjunction with visual diagnosis of the suspect colonies.

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Sucking-type specimen mouth-aspirators (pooter) are particularly well suited for collecting adult beetles, as are converted hand-held vacuum cleaners, which are frequently used for gently collecting insects for research purposes.

For collecting eggs or beetle larvae, infested honeycomb parts can be cut out using a knife and dispatched as a whole.

Transport

Break-proof containers which can be closed tightly are suitable for transport purposes. The precise collection site and the finder's full address should be provided on the container or in an accompanying note. Prior to transport, all suspect animals should be killed (e.g. by deep-freezing of the sample containers overnight). Live insects must not be transported under any circumstances.

Transport of bee colonies within Germany

For transport within a German federal state, the valid regulations for transport of bee colonies of the respective state must be observed. In case of transport within Germany, the regulations of the destination state apply. In case of transport to a different German Federal State, a health certificate issued by the competent authority of the original location must be presented to the competent authority of the place of destination immediately after arrival.

Intra-community transport of bee colonies

When moving bees from Germany to another member state of the European Union (intra-community transport), the regulations of the German Internal Market Epizootic Protection Ordinance (BmTierSSchV) must be observed. According to this, the competent authority at the place of origin must confirm in a health certificate (according to Annex E, Part 2 of Council Directive 92/65/EEC in the respective valid version) that the bees

- originate from an area where no ban has been imposed due to American foulbrood. The ban period is at least 30 days after detection of the last case and the point in time when all beehives within a range of 3 km have been inspected by the competent authority, and all infested beehives have been burned or treated, and subsequently been inspected by the respective authority and no objections have been raised;
- originate from an area with a minimum radius of 100 km, in which no restrictions apply due to the occurrence of small hive beetles or *Tropilaelaps* mites and in which these pests do not exist;
- and whose packaging has undergone visual inspection in order to ensure that all bees and packaging are free of small hive beetles and *Tropilaelaps* mites.

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Import of bees to the European Union

Commission Regulation (EU) No. 206/2010 governs the transport of honey bees and bumblebees from non-EU countries to the European Union. According to this regulation, transport of queen bees (*Apis mellifera* and *Bombus* spp.) in cages with a maximum of 20 accompanying bees and transport of bumblebee populations with a maximum of 200 adult individuals are permissible if they:

- originate from regions in which the occurrence of American foulbrood (with regard to AFB, the above-mentioned guidelines for intra-community transport are also valid for import into the European Union), the small hive beetle, and the *Tropilaelaps* mite is notifiable;
- originate from breeding establishments which are examined and inspected by the competent authority;
- originate from an area with a minimum radius of 100 km, in which no restrictions apply due to the occurrence of small hive beetles or *Tropilaelaps* mites and in which no infestation has been detected;
- originate from populations examined for symptoms or indications of a disease or infestation with bee pests directly prior to transport;
- have been examined in order to ensure that all bees and packaging are free of small hive beetles and *Tropilaelaps* mites.

Legal bases

German national law

“**Bienenseuchen-Verordnung**” of 03 November 2004 (= bee disease act) in the respective valid version; includes the regulations for combatting bee pests (American foulbrood, infestation with the small hive beetle and infestation with the *Tropilaelaps* mite, acariosis and varroosis).

“**Binnenmarkt-Tierseuchenschutzverordnung**” (= Ordinance on the Intra-Community Transport, Import and Transit of Animals and Goods) of 06 April 2005 in the respective valid version; regulates the intra-community transport and import of animals and goods.

„**Verordnung über anzeigepflichtige Tierseuchen**“ (= Ordinance on Notifiable Epizootics) of 19 July 2011 in the respective valid version; includes a list of notifiable animal epizootics.

“**Tiergesundheitsgesetz**” (= Law on the Prevention and Control of Epizootics) of 22 May 2013 in the respective valid version; provides the basis for the State to control epizootics.

General Administrative Provision for Epizootics News of 24 November 1994; regulates the responsible authorities' notification duty to the Federal Ministry of Food and Agriculture (BMEL) when notifiable epizootics occur.

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EU Law

Council Directive 90/425/EEC of 26 June 1990 concerning veterinary and zootechnical checks applicable in intra-Community trade in certain live animals and products with a view to the completion of the internal market (in the respective valid version).

Council Directive 92/65/EEC of 13 July 1992 laying down animal health requirements governing trade in and imports into the Community of animals, semen, ova and embryos not subject to animal health requirements laid down in specific Community rules referred to in Annex A (I) to Directive 90/425/EEC (in the respective valid version).

Commission Decision 2003/881/EC of 11 December 2003 concerning the animal health and certification conditions for imports of bees (*Apis mellifera* and *Bombus* spp.) from certain third countries and repealing Decision 2000/462/EC (in the respective valid version).

Commission Regulation (EU) No. 206/2010 of 12 March 2010 laying down lists of third countries, territories or parts thereof authorised for the introduction into the European Union of certain animals and fresh meat and the veterinary certification requirements (in the respective valid version).

Commission Implementing Decision 2014/909/EU of 12 December 2014 concerning certain protective measures with regard to confirmed occurrences of the small hive beetle in Italy (Only the Italian text is authentic) (Text with EEA relevance).

Commission Implementing Decision (EU) 2015/1943 of 27 October 2015 amending Implementing Decision 2014/909/EU by extending the period of application of the protective measures in relation to the small hive beetle in Italy (Text with EEA relevance).

Commission Implementing Decision (EU) 2017/370 of 1 March 2017 amending Commission Implementing Decision 2014/909/EU by extending the period of application of certain protective measures and amending the list of areas subject to protective measures in relation to small hive beetle in Italy (Text with EEA relevance).

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Contact person for further information

If you have any questions or need help, or if you suspect a case of infestation, please contact the competent veterinary diagnostic agency in your area, a bee institute, your official veterinarian, a specialist advisor, or directly to the German National Reference Laboratory:

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