

European Code of Practice for Bed Bug Management

Guidelines for the use of Scent Detection Dogs in Bed Bug Management



www.bedbugfoundation.org



The Standards, Codes of Practice and Guidelines of the Bed Bug Foundation are intended to reflect the current state of the art and are based on generally accepted and shared insights.

The curators of the BBF would like to thank all of those who were willing to support the emergence of these standards through patronage, critical feedback and new ideas.

Furthermore, the standards issued by the BBF are not to be understood as finished documents, but as a summary of the currently valid state of technical knowledge. The BBF is dependent on feedback from all the sectors concerned in order to constantly revise and further develop the standards.

All major changes will be posted on the web site for open discussion; Minor changes are at the discretion of the Senate (www.bedbugfoundation.org/senate).

All suggestions for improvement can be submitted via www.bedbugfoundation.org/feedback or by e-mail to info@bedbugfoundation.org.

These guidelines are provided by the Bed Bug Foundation for the English-Speaking public.

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Introduction

While some individuals in the pest control industry are skeptical about the use of canines for detection, these specially trained canines boast a 95% (University of Florida Department of Entomology) accuracy rate in finding live infestations. This is compared to only 30% accuracy of humans with visual inspection.

Bed bugs go through five stages of development, and in most of these phases, they are no larger than the size of a sesame seed. The eggs and nymphs are off-white to yellowish in color, which makes them hard to see on light colored bed sheets and carpets. The adults are about the size of an apple seed, and although they are easily seen while in the open, they are extremely good at hiding.

Bed bug detection dogs are a viable and scientifically-proven alternative to traditional methods of pest detection. A 2008 report by the University of Florida(1), Department of Entomology endorsed bed bug detection dogs by stating that the “reliability of the dogs has been impressive provided they are properly trained“.

The results of the Florida study are relativized by recent investigations by Cooper, Wang and Singh (2). We have endeavored to take account of the results of this study in this guide and, in particular, to formulate the recommendations for the use of sense dogs accordingly.

The Bed Bug Foundation has come up with the Code of Practice and the Certifying Process to establish working standards for all Bed Bug Detection Dogs, Handlers, and Trainers through an accredited program.

The Bed Bug Foundation web site is also a place where consumers can go to check and see if a Team is certified and a place where they can voice their concerns and complaints.

(1) Ability of Bed Bug - Detecting Canines to Locate Live Bed Bugs and Viable Bed Bug Eggs MARGIE PFIESTER, PHILIP

G. KOEHLER, AND ROBERTO M.PEREIRA, Department of Entomology, University of Florida, Gainesville

J.Econ.Entomol.101 (4):1389D1396 (2008)

(2)Accuracy of Trained Canines for Detecting Bed Bugs (Hemiptera: Cimicidae) RICHARD COOPER, CHANG LUWANG,

And NARINDERPAL SINGH, Department of Entomology, Rutgers University, New Brunswick, J.Econ.Entomol.107 (6):2171-2181 (2014)

Which Breeds are best suited for Bed Bugs?

Hunting breeds, such as Blood Hounds and Beagles, are popular to use because they have been bred for centuries to seek out prey and fetch the carcasses for their handlers.

Typically, smaller breeds are preferred because they are less intimidating to residents who have aversions to dogs. Smaller dogs are also better at working in confined spaces, such as around beds in small and/or cluttered bedrooms. Australian Shepherd, Labradors, Jack Russell Terriers, and Border Collies are a few other breeds that are often used.

Basically any breed with a high play drive, or a high desire to please their handlers can be trained to be a detection dog.

Training

A dog can start learning the basic commands at a very young age, however the Bed Bug Foundation recommends that you first start with the intensive detection dog training between nine and twelve months. The dog should have a solid work ethic, and no aggressive behavior. Timid or aggressive dogs should not be used because their behavior can be unpredictable when entering new locations and socialising with other persons.

When to start training

Training begins with basic obedience where the handler and dog learn to work together. The dog should be able to carry out the commands; sit, lie down and stay before the training can continue (This is the part of the training that can take place at a younger age).

Food reward or play reward?

The basic principal of scent detection training is teaching the dog that when it finds a certain odor (e.g. bed bugs) it will receive a reward. Before the handler can begin with the training process they must decide which type of reward they want to use; toy or treat.

- **The Toy method** uses the dog's play drive, along with its desire to please its handler.

Pros- Playing with the dog during the training process strengthens the bond between handler and dog.

Cons- Play can be disruptive for dogs that become easily over excited.

- **The Treat method** uses the dog's desire for the treat, along with its desire to please its handler.

Pros- For dogs that are over excited, food can be a calming way of motivating them to work.

The treat method can also be used for canines that don't have a high play drive.

Cons - In areas that a Bed Bug Detection dog will be used, Air Craft, Hotels, Hostels, and Dwellings there is a high probability that the dog will find pieces of food and this could distract him from his main goal of searching. A canine that has just eaten may have a reduced desire for the treat and may therefore be less motivated to work.

Both methods can be used. Each handler must judge his dog and then determine which method is most appropriate.

Initial training steps

A bed bug detection dog has the task of finding “living bed bugs”. Therefore it is important to place live bed bugs in a small suitable vessel, that they cannot get out of (covered with a tight mesh netting).

A training box is any box or container with holes at the top, that both the toy and small mesh covered container of bed bugs will fit in.



These training boxes are from K-9 BSD

The Carousel contains 5 arms or more, on the end of each arm is a sample container containing different substances.



Carousel

The beginning of odor identification:

The Bed Bug Foundation has found that in the early stages of odor identification the dog learns to identify the scent more quickly and easily when a large number of bed bugs are used. The stronger the target odour is, relative to the background odours, the easier it is for the dog to understand which scent it is that it should be searching for.

In the initial odor identification training the dog will only be required to sniff the box with the bed bugs to get his reward. Timing is very important here. At the instant the dog sniffs the odor; the handler immediately says GOOD DOG and gives the dog his reward (toy or treat). As soon as the dog has learned to sniff the box with the bed bugs, a second box without bud bugs should be added. Then after the dog has received several trails with the two boxes, a third and fourth box can be added.

The same procedure is used with the carousel, first only one sample container, and then you can add on more containers one at a time.

After the dog has been run through several trials in the four box discrimination task, it will begin to alert after it sniffs the box with bed bugs. Once this alerting behavior is noticeable, the sit or lay down command should be used.

This exercise should be done in a room containing only the four boxes.

Once the dog can discriminate between the box with the bed bugs and the empty boxes, other odorous materials should be put into the empty boxes. The purpose here is to insure that the dog is not simply responding to “something versus nothing” but that it is discriminating the odor of the bed bugs from the other odors. Any material which has been or will be systematically associated with the bed bugs must be included. For example, any packaging material with the bed bugs, jars, nets, training vials, rubber gloves (if used to handle training vials) should be placed in the other boxes.

Up to this point the handler has known which box contained the bed bugs, which insured that the reinforcement, as later in training there will necessarily be times when immediate reinforcement is not feasible, unless the dog has had some exposure to such delays in reinforcement , an unexpected delay could disrupt the dog`s behavior.

There are three phases in this training step.

- Phase 1 introduces a delay between the time the handler says GOOD DOG and the time he gives the reward.
- Phase 2 introduces a delay between the time when the dog sits and the time the handler says GOOD DOG.
- Phase 3 is a combination of both these delays on a single trial. Although the length of delay in reinforcement may be extended later in training, a moderate delay (up to 5 seconds) should be sufficient at this stage of training. Each delay should be built up gradually beginning with no delay.

Once the dog is confident in recognizing the odour, the number of bugs can slowly be reduced. A well trained dog should be able to locate a single bed bug in a ventilated vial.

Indicating the target

Dogs can indicate the location of a target to their handler in many different ways.

- Active indications include barking and scratching at the location of the target.
- Passive indications include sitting, lying down, or staying at the location of the target, and using the nose to pinpoint the exact location.

The Bed Bug Foundation discourages the use of any active indication methods. Barking is not appropriate in any domestic setting, particularly where discretion is important, and any disturbance of the target site by scratching has the potential to disperse bed bugs away from the harbourage site, potentially complicating the treatment process.

Bear in mind that for any accreditation the dog's indication will need to be clear to the examiner, as well as the handler, so indications should be clear and unambiguous.

False alert

There will be occasions when the dog will alert where there are no bed bugs present.

The question is: What to do when the dog alerts on one of the other odorous materials? While there are various possible ways to deal with this type of error, the best overall is to give the conditioned negative reinforce NO followed by removing the dog from the vicinity of the boxes. For example: If during discrimination training in the two, three or four box discrimination task, the dog approaches, sniffs the other odorous material and alerts, the handler should say NO in a normal tone and take the dog back to the starting position. Do not pet or otherwise praise the dog until it has made a correct response. If the dog continues to make false alerts in this situation, it is most likely that it has not made the association between the odor and the alert response.

If the association between the bed bug and the alert response has not been made, revert back to giving praise and reward without requiring the dog to sit.

When the dog starts to make frequent errors, return to a more elementary stage of training and work back up to the point where the desired behavior started to break down.

Do not wait until the undesired behavior has become chronic before backing up.

Always back up enough to insure that the dog will respond successfully; then, after a period of correct responding at the more elementary task, then continue to move gradually toward the desired goal.

Familiarizing the Dog with Other Environments

Seeing how the teams will be going into different types of areas or buildings with stairs, noisy places, etc., the socialization and exposing the canine to various types of building ahead of time is very important. That way the canine will be able to work efficiently.

It is recommended that before you search an area that is new to the canine, that you first take him into the area to see how he reacts.

Advanced Training Exercises

The next step is to start the canine in searching other areas. The Bed Bugs should then be hidden in other areas such as under a bed, in a desk or closet, ext. As the training exercises proceeds, you want to make the search times and areas grow larger.

When handling the training jars, tubes, etc. wear rubber gloves to keep your odour away from getting on the training aids.

Make sure you clean the training aids daily, to keep the canine from learning the smell of feces, cast skins or dead bugs.

A dog`s keen ability to detect odors is an obvious advantage in detection training; however, problems such as contamination will arise if extreme care is not taken when working with the odour.

No two dogs will learn at the same rate, thus all training must be programmed to suit each individual dog. The entire training program is based on the gradual assimilation of new behaviors which can only be learned if the dog has mastered the previous task. If a dog is slow in learning a particular task, it is essential that it be given additional practice at this task before it is introduced to the next training task.

If a dog is pushed into new learning situations, before it has mastered a more elementary one, it probably will not be able to learn the new task.

Do not make the mistake of rushing the dog.

It is essential to keep records of the dog`s daily performance during training.

On or Off Leash Training

The dog should be trained to work on or off leash. Once the dog is working well on-leash with a handler who does not know the location of the bed bugs in the discrimination task, a series of hides with the canine off-leash should be run. If the dog has been working well on-leash there should be no difficulty in working it off-leash.

Pseudo Scents

Unlike pseudo scents for explosives and drugs, the bedbug pseudo scent is extracted directly from live bedbugs, so it is a genuine bedbug odor, and not a synthetic alternative. The published study by Pfeister *et al.* showed that 100% of dogs trained on live bedbugs recognized and indicated on bedbug pheromone extracts derived in this way.

The main disadvantage of this approach is that it is impossible to equate the pseudo scent to a known number of bedbugs. There is also a possibility that the dog may be able to detect some residue of the solvent on the paper strip. For this reason, we feel that a combined training approach utilizing both live bugs and a pseudo scent is likely to produce the best results.

Pseudo scents are not allowed for the use in any certification.

Bed bugs - what the handlers should know.

Anyone working in the field of bed bug detection should have a basic understanding of bug biology and behaviour. They should be absolutely confident about the recognition of all bed bug life stages, including cast skins and eggs. They should also have a good understanding of the typical locations in which bed bugs can be found. All of this information can be found in the European Code of Practice for Bed Bug Management (v2), which can be downloaded for free from www.bedbugfoundation.org. Section 3.2.1 gives detailed information on recognising the signs of an infestation, and Section 7 gives guidance on conducting an inspection.

Use of certified bed bug dogs

These guidelines have been written for dog handlers who want to work with their dogs as qualified Bed Bug Detection Dog Team (and those who have already qualified).

In addition, there are some pest control companies who have been fighting against bed bugs for a long time and would like to use their own dog to cover a large range of reliable detection.

The BBF hopes to provide valuable information for both target groups with this code.

Dog handlers who do not offer pest control themselves should avoid doing a control without a qualified pest control company when possible. The reason for this is 1) when there is a positive find the pest control company can verify the find and 2) the pest control company can discuss the find and possible necessary measures that need to be taken with the customer.

If this is not possible, the dog handler should inform the customer beforehand what he can and cannot do (would be a good idea to have this in writing and signed by both parties).

When should a Detection Dog Be Used

There are a few classic scenarios when a detection dog can be used.

- First is to check the treated area from the pest control companies to see if bed bugs are still present.
- Where bed bugs are suspected but no traces of bed bugs can be seen.
- To help control a large area in a short time (Hotel)

All scenarios have to be treated different in detail, but basically in the same way.

It is important to keep a time gap between the last application of biocides and the search with detection dogs.

So that residues of chemicals do not influence the dog negative manner in his in his search (or Worse, in its health).

In situations where a large or strong infestation is confirmed, there is no need in bring in a detection dog, other than to control the area after treatment.

Preparation of search area

A well trained detection dog provides a very sensitive diagnosis and finds individual live bedbugs or eggs. If possible, the search area (apartment, Hotel room, bus, ect.) should not be cleaned. It is not about possible contamination by the dog, or to make it easier for the dog. It is about detecting even the smallest contamination of bed bugs.

Pets should be removed from the search area. Ventilation systems, air conditioning units Ect. Should all be switched off and strong smelling substances (incense candles, room fragrances Ect.) should also be blown out.

How long can a search dog work?

Dogs are living things, not measuring instruments. Like any other living being dogs have good and bad days. Each dog has an individual performance level.

Even if it appears to an outsider that the search from a well-educated and trained dog fast and easy is, it actually is very hard work for the dog. The dog is only concentrated for a limited time, then he needs a rest, a walk or a completely different activity. This needs to be taken into consideration when doing the planning for a large search area (e.g., all the rooms from a hotel)

As a rule, one can assume that after searching for 20 minutes the dog should become at least a 30 min break. After another 20 minutes searching he should become at least a one hour break.

The dog handler always decides how long his dog can work and how long his break should be. Even if the accompanying pest controller or the customer demand "Just a little more". If the condition of the dog requires it, then the search should be canceled and resumed at a later time or on another day.

In all discussions the dog handler decides primarily for the sake and health of the dog.

A bed bug detection search is not only hard work for the dog but also for the dog handler, he must be concentrated throughout the whole search. First, so the he can correctly read his dog, and second that he does not inadvertently influence his dog with his behavior to make a false indication.

Documentation / Reports

A dog handler should document the findings that his dog displays, so that they will also stand up in court. Most modern cell phones are equipped with a digital camera, (don't forget to turn on the location functions, so that the place and time of the recording are also displayed) this also helps to show the exact location where the dog has made a find.

Whenever possible, a positive find by the dog should be immediately verified if there are any visual signs of bed bugs, or eggs, when yes which?

Whether further reports are desired is in the direct negotiation between the client and the dog handler.

Further action

The goal of a bed bug detection dog team is to assist in the finding if bed bugs are present or not. On what further procedures or actions that need to be taken after the detection team has made a positive find, the customer needs to consult a pest control company of their choosing and make that decision.

What are the cost of using a Detection Dog?

Within the scope of the BBF guidelines for detection dog teams, we cannot make any declaration on what the cost should be.

Testing and certification

Certification requirements & certification process

Requirements

Admission requirements

1. ...for Dog handlers
 - A Criminal back ground check.
 - Consent to the publication of your name and E-Mail Address on the website of the BBF.
2. ...for Dog
 - The dog must be at least 15 months old.
 - The identity of the dog must be proven without doubt.
 - A valid vaccination record (the legal requirements of each individual country are to be followed) and a veterinary certificate of health are to be presented.
 - The dog must show neutral reactions towards reasonable environmental influences. A BBDD may be led by two dog handlers. Both handlers must be certified with the dog.
 - Dual scent trained dogs will not be certified under BBF Standards. Excluded from this rule are rescue dogs. Excluded from this rule are rescue dogs.

Bed Bug Detection Dog Team

A team will consist of a handler and a canine.

If at any time the handler and canine separate, they are no longer BBF Certified.

The BBF does not certify dogs or handlers, only teams.

Basic Training

The entire first part of this Code is devoted to training.

The BBF expects that the guidelines are the guidelines being used in the training of the detection dogs.

In principle, however, every dog handler is free to choose his training methods.

The BBF recommends that the following subjects be covered:

- Drive and search condition. First aid for the canine.
- Odor identification. Principle knowledge of the canine.
- Pointing out a target. Bed Bug Information
- Search patterns.

Test

The Bed Bug Foundation will do its best to provide at least four (4) to six (6) certifications a year throughout Europe. The certifications will be posted on the BBF web site.

General information

The Examination will consist of two parts: Practical and written.

The Examination will be conducted by a Bed Bug Foundation Evaluator.

The team's trainer can assist the examiner in the certification, but has no decision-making authority.

No overly harsh or inappropriate physical corrections by the handler to the dog will be permitted. If so the result will be an immediate disqualification. The BBF will report this to the welfare law of the host country.

All alerts must be done in a passive technique.

Whenever possible the exam should be given in an inside interior (regional availability). The Exam will be in a dwelling house, a hotel or hostel, an office building, warehouse or in a means of Transport (bus, airplane).

- **Hides:**
Set at least thirty (30) minutes prior to the start of the certification.
Hidden in a place of concealment which is not visible to the dog or handler.
- **Evaluators:**
Will designate the area of the structure to be used for the examination. Will designate the area in which the team is to begin their search. Will accompany the team into the structure and must be able to observe the test. If it is obvious to the evaluator that the dog is not working, the evaluator will inform the handler and the handler will remove the dog from the test area and have not more than 30 minutes to return to the test area to repeat the test. Failure of the dog to work a second time constitutes a failure for the test.
- **Dog Handler:**
During the certification process, the team will be assessed by the evaluator, whether the co-operation between dog and dog handler is harmonious. The examiner will also examine the behavior of the dog for neutral reactions toward environmental influences and to note if the dog shows any unwanted or aggressive Behavior.
If there are any problems in these areas, the Certification will be automatically discontinued.

The test may be done on or off lead. Equipment normally used, collars, harness, ect. can be used. The handler will accompany the dog throughout the test, and may encourage his/her dog with commands and praise as needed.

Theoretical test

The written test has 15 questions, to pass, 12 questions must be answered correctly. You may only pass onto the practical test if you pass the written part. If necessary, an (immediate) verification can be carried out in the form of an oral examination. If the verification is unsuccessful, the test cannot be continued.

Practical test

The practical test will contain 5 hides, 4 live hides and one distracters.

Dummies / Distractors are either training material with dead bedbugs (Dead for at least two weeks), and any other training material.

To pass, the team must find 3 live hides and not hit on a distracter (which constitutes an automatic failure), and there was not more than one misrepresentation.

The evaluator will decide how many Bed Bugs will be used for the certification. There will not be more than 15 and not less than 5 Bed Bugs for each hide. Pseudo scents are not allowed for the use in any certification, only live bed bugs.

The Evaluator will decide what distracter will be used. Distracters can be placed in the same room as a live hide.

The decision to run the dog on lead or off, also fine or coarse search, is the responsibility of the handler, and can be changed throughout the certification.

The alert must be obvious to the evaluator.

In case of doubt, the evaluator can request an additional search for the team.

Failure to pass certification

If a team does not pass certification, they can retry in four (4) weeks.

Should the team fail to pass the certification a second time, they must wait three (3) months to re try. Each additional certification cost 65,00 Euro, plus the extra costs for the evaluator.

Certification

Upon successful completion of the certification, a certificate will be issued to the passing team.

The dog handler is asked to submit a passport photo of himself and one of his dog (preferably in digital format) to the BBF.

These will be printed on the identity card (ID card).

A BBF certification is valid for one year from the date of issue. In justified cases this can be extended to 15 months with a written application

Costs

The certification costs will be published on the Bed Bug Foundation website and at the moment (December 2016) are 170, - Euro per team. The costs include the Certification, ID card and one-year membership for the Bed Bug Foundation. The fee must be paid when the team is registered for the certification.

If a dog handler wants to have several dogs certified, the costs will be 65,00 Euro for every additional team.

In addition to the certification costs, the teams must also pay for all travel expenses (Kilometers and accommodation) of the evaluator. The kilometer costs are determined on the current rate of the respective country.

These costs can be reduced or avoided if:

- The certification is at a BBF sponsored certification.
- The certification is held in or around the area that an evaluator comes from.
- The cost can be divided up between more teams that want to also take the certification and the same place and time.

