



# Biogents

Science for your protection

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# Manual

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for the

# ***BG-Sentinel Midge Trap***

## Introduction to the BG-Sentinel Midge Trap

Congratulations on your purchase of the BG-Sentinel Midge Trap. You have bought the latest innovation in midge traps that is the result of thorough scientific research at the University of Regensburg, Germany.

The BG-Sentinel trap incorporates patented, as well as patent pending, technology and was initially developed to enable researchers all over the world to monitor the yellow fever mosquito, also known as dengue mosquito, *Aedes aegypti* and the Asian tiger mosquito *Aedes albopictus*.

It mimics the convection currents that are created by a human body via artificially generated air plumes, employs attractive visual cues, and releases a patented 3-component scent imitator that mimics human skin through a large surface area.

The trap is large enough to incorporate additional attractants (for example animal hairs, worn clothing, small animals, food, light and heat sources) making it a very versatile tool for other researchers.



Numerous independent studies have been conducted with the BG-Sentinel all over the world, and it has been proven to be the most effective mosquito trap on the market. For an extensive list of all the publications on the BG-Sentinel, please visit our website.

Biogents has adapted the renowned BG-Sentinel mosquito trap into a trap specifically designed to catch these disease transmitting vectors in large numbers and within a novel protection concept against Blue Tongue Disease.

The BG-Sentinel Midge trap is used by the German surveillance program against Blue Tongue vectors (*Culicoides*). There have been no reports of human transmission of Blue Tongue Disease however it can cause serious disease in livestock, esp. cattle and sheep.

### Technology & Safety

- The BG-Sentinel uses innovative patented and patent-pending technology.
- The BG-Sentinel is safe and easy to handle, requires an electric power supply of only 12 Volts and does not emit toxic chemicals.

### Eco-Friendliness:

- In contrast to most other traps, the BG-Sentinel trap does not catch beneficial insects such as honey bees, ladybugs, and butterflies.
- It does not use insecticides or pesticides.

- The trap alone requires no more than 3.4 Watts per hour. Together with the UV-light it requires 8.4 Watts.

## Trust & Competence

BG-Sentinel is used **(u)** or was successfully tested **(t)** by independent, reputable organizations all over the world, including:

- The World Health Organization, WHO **(u)**
- The German, French, and US armed Forces **(u)**
- Centers for Disease Control and Prevention (CDC), USA **(u)**
- Pasteur Institute, France **(u)**
- London School of Hygiene and Tropical Medicine (LSHTM), UK **(t)**
- Tropical Public Health Unit Network - Cairns, Australia **(u)**
- AQIS Australian Quarantine & Inspection Service **(u)**
- Federal University of Minas Gerais, Belo Horizonte, Brazil **(u)**
- Federal Ministry of Food, Agriculture and Consumer Protection, Germany **(u)**
- Bill and Melinda Gates Foundation projects in Asia and Brazil **(t)**

## Flexible Use & Possible Upgrades:

- The BG-Sentinel is collapsible (diameter: 35 cm; height: 10 cm) and light (0.8 kg) making it easy to transport, carry, and store.
- The BG-Sentinel can be easily assembled in as little as 5 minutes and does not require the use of any tools.
- The BG-Sentinel can be safely used indoors (without CO<sub>2</sub>) as well as outdoors, according to your needs.
- The BG-Sentinel is large enough to incorporate additional attractants (fragrances, small animals, worn clothing, animal hairs, lights) making it a very versatile research tool.
- You can upgrade the BG-Sentinel with the Biogents proprietary CO<sub>2</sub> device.

## User Information

Thoroughly read all information contained within this manual before operating the BG-Sentinel.

The Biogents® Sentinel™ Midge trap needs to be protected from rain and direct sun exposure, and should be placed in an area where it will not be submerged in water. The trap and the transformer need to be protected from intense heat (above 40°C) and extreme cold (below 5°C). The BG-Sentinel™ should also not be used in very dusty surroundings, as the dust may clog the nets and the gauze covering which obstructs the air currents.

For best results, the trap needs to be permanently operated. If switched off, the catch bag needs to be removed and closed. Otherwise, caught insects are able to escape from the catch bag.

Please only use accessories and spare parts that are recommended by the manufacturer. The use of other nets or gauze with the trap can significantly reduce the catch rate or even completely render it ineffective. The manufacturer is not held liable, in any case, if the product is improperly used or if any variations are made to the product. Please pay close attention to all of the information that is contained in the instruction manual.

## Parts List

The BG-Sentinel Midge trap includes the BG-Sentinel Full Version trap (basic version trap plus accessories) plus the UV-Light Set for Biting Midges which includes the UV-Light Set plus a beaker catch bag, two plastic beakers that are placed within the beaker catch bag for diluted alcohol or other liquids to instantly kill and preserve the catch, one 5mm mesh cover net that excludes larger insects from the catch pipe, and one line to hang the trap.

### BG-Sentinel Full Version Trap:

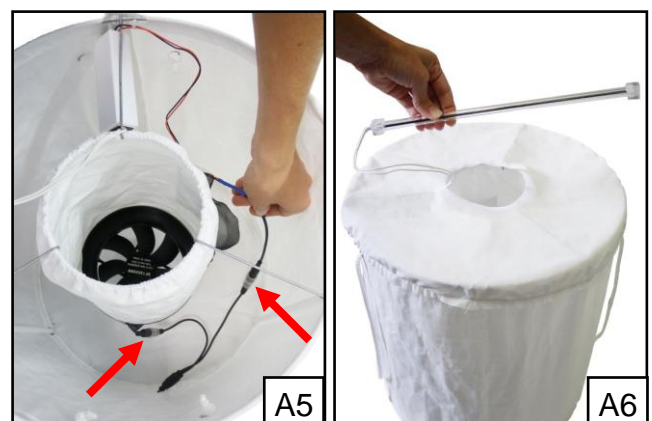
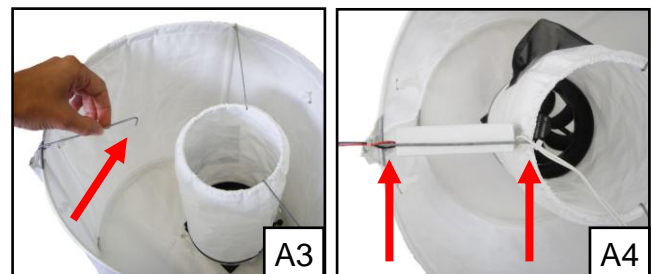
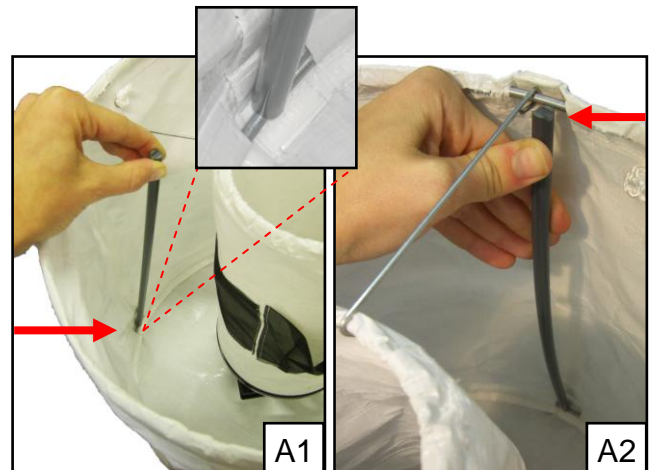


### UV-Light Set for Biting Midges:



## Assembling the Trap

1. Take the trap and all of the contents shown on the previous page out of its green carrying bag.
2. Unfold the collapsed, white trap (5) including the inner suction tube and fan and straighten it out into a standing position.
3. Insert the three mounting poles (6) into the inner side of the trap by first placing the pole onto the metal ring in the openings on the bottom of the trap [Fig. A1] and then slightly bending it to place the top of the pole under the metal ring that encompasses the top of the trap. [Fig. A2]
4. Unhook one of the three metal hooks that holds the inner suction tube into place [Fig. A3] and thread the hook first through the red and black wires from the converter on the UV-Light and then through the white wires from the converter to attach the converter to the metal hook. [Fig. A4] Make sure to thread the metal hook between the converter and the white cable ties on the wires. Reconnect the metal hook to the inner suction tube.
5. Connect the Y-Power Cord to both the UV-Light (10) and the Fan *inside the trap*. Thread the single end of the Y-Power Cable out of the opening located at the bottom of the trap. [Fig. A5]
6. Place the white gauze cover (4) over the top surface of the trap and make sure to put the UV-Light through the middle opening. Make sure the gauze cover is taut and tie the drawstrings together. [Fig. A6]

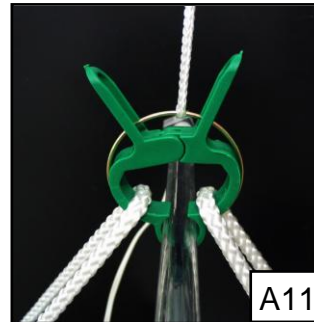


7. Next, place one of the white plastic beakers (12) into the black beaker catch bag (11) [Fig. A7] and attach it to the bottom of the intake funnel (1). [Fig. A8] Make sure the seam of the catch bag is facing outward.



8. Fill the second catch beaker  $\frac{3}{4}$  of the way full (~300 mL) with diluted ethanol and pour this amount carefully into the catch beaker that was placed into the beaker catch bag being used.

9. Now insert the black intake funnel with the attached beaker catch bag into the central opening of the trap [Fig. A9] and attach the mesh cover onto the intake funnel. [Fig. A10]



10. Locate an optimal place to hang the trap according to the following instructions on positioning the trap. Take both handles of the trap along with the UV-Light and clip it into the green clip provided. [Fig. A11] You can then use the string provided to hang the trap from the green clip.

11. Connect the single end of the Y-Power cable to the chosen choice of power supply unit or battery mounting cable.

## Positioning of the Trap

*The correct placement of the trap is an important factor that heavily influences its effectiveness.*

### Outdoor Use (the trap can be operated with or without CO<sub>2</sub>):

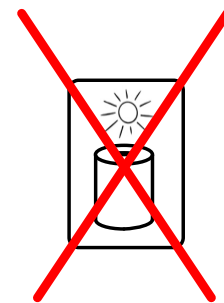
Position the trap in a location that is sheltered from wind, heavy rainfall \* and direct sunlight.



**Not in wind**



**Not in heavy rainfall**



**Not in direct sunlight**

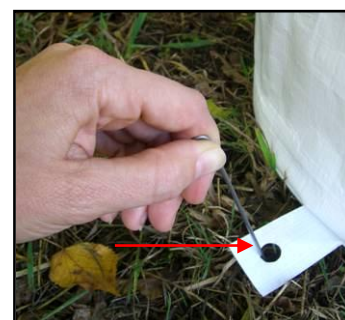
### Optimal Positioning:

- The trap should be positioned close to midge breeding sites such as any wet or moist area. Larval development is found in dunghills, flat corn silos, slurry basins and seeping areas.
- **Close to the livestock** (inside / outside)
- The UV-light should be visible from all directions
- In normal stables, position the traps close to the windows
- Ideal locations to position the trap are *close* to resting areas of midges such as bushes, shrubs, hedges, or any other foliage; however placing the trap *in* very tall grass or under bushes will impair its effectiveness. The trap should be clearly visible to patrolling midges.



The BG-Sentinel is very stable and durable but also lightweight. To keep the trap from toppling over you can:

1. Insert tent stakes into the holes in the side flaps.
2. Attach strings to the handles of the trap and fasten them to the ground with tent stakes. (pictures above)
3. Hang the trap from the handles above the ground.



### Sheltering the Trap from Rain:

Even though rainfall does not damage the trap, it can make it difficult for insect identification purposes. It is best to position the trap under some form of shelter (e.g. an overhang, roofed area, or a self hung tarpaulin) to keep it out of direct rainfall.

It is important to comply with the following regulations when sheltering the trap from rain:

1. Whatever is placed over the trap must be at least **1.5** meters above the top surface of the trap. Any distance lower will hinder the visual signals and air currents of the trap and consequently reduce the catch rate.
2. Make sure the shelter covers an adequate area around the trap, so that rain cannot enter from the sides.
3. Make sure the shelter is stable and durable.



### Indoor Use (do not add CO<sub>2</sub>):

It is important that the trap is not placed in front of, or close to, backgrounds with a lot of contrast (i.e. in front of a book shelf) because the trap uses a black and white contrast as a visual stimulus and the mosquitoes could be distracted from the trap. A good position would be in front of the window, for example.

### Removing the catch beaker:

1. Carefully remove the black intake funnel with attached catch beaker from the BG-Sentinel trap. Keep in mind the catch beaker is still full of the diluted ethanol and your catch!
2. Place the catch beaker on a sturdy flat surface and remove the intake funnel from the beaker catch bag. You can now take the catch beaker out of the beaker catch bag.



3. With the help of a funnel, empty the contents of the catch beaker into a container of choice.

## Maintenance

All nets must be kept clean, including the white gauze covering and catch bag! Any dirt or dust can clog the pores of the nets and hinder the air flow. In case they need to be cleaned, wash them (by hand or machine) with non-perfumed soap to avoid odour contamination! The residue from cleaning agents may have a repelling effect on the mosquitoes and consequently reduce the catch rate.

If the catch bag is damaged or torn it should be replaced, as the mosquitoes are able to escape. Extra catch bags, replacement sets and other accessories can be purchased from your supplier.

## Power supply and electricity

The suction fan requires a power source of 9 to 12 V DC (max. 280 mA). The suction fan requires a power source of 9 to 12 V DC (max. 280 mA). An optional power supply unit (EU Version 220V input, 12V output) with fitting plug connection is available. There are also extension cords (20m) and battery mounting support cables available. Please refer to our Product Catalog.

### Batteries

We usually recommend 12 Volt motorcycle or car batteries – these are easily rechargeable and readily available in most places. Together the ventilator from the trap and the UV-light source require 8.4 Watts. As a rule of thumb, you will need a battery capacity of 20 Ah for each midge trap (ventilator plus UV-light) with a 24 hr trapping period. This includes a security factor which should give you a peace of mind in most real-life situations.



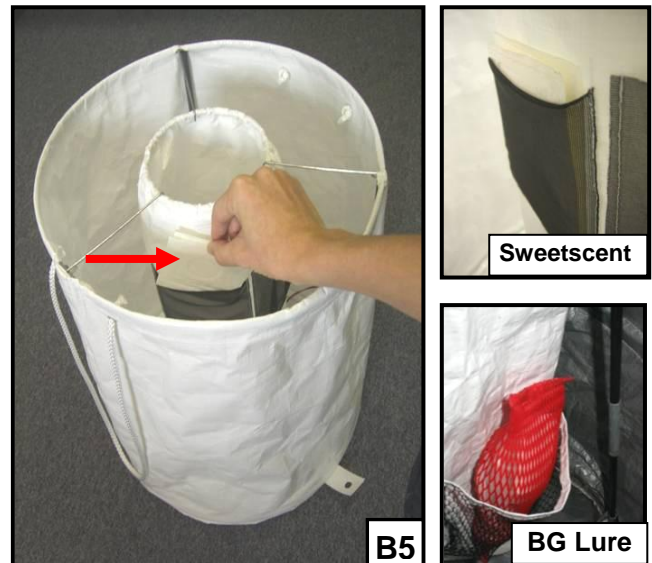
## Lures and Attractants

In principal all kinds of lures can be used with the trap. Simply place the lure inside the trap in the black mesh pocket located on the outside of the suction tube.

We offer our special patented BG-Lure, which mimics the scent of human skin and releases a mixture of several compounds for up to five months. We also offer the Biogents Sweetscent attractant which is similar to the BG Lure, but does not have as strong of potency, lasts 2 months, and is ideal for indoor use. Both products use substances which are classified as non-toxic and attract blood seeking insects that prefer to feed on humans.

### Inserting the Sweetscent & BG-Lure:

1. Open the package that contains the lure.
2. Take the lure out of the package.
3. Place the lure inside the black mesh pouch (7) located on the outside of the suction tube (8) [Fig. B5]



**NOTE:** In tropical climates the release rate of the components can be higher which may lead to an increase in odour and a shorter life span of the dispenser. In these regions it may therefore be better to leave the dispenser in its original package and cut a hole about 15mm wide into the package and place it into the trap.

## Adding CO<sub>2</sub>

The addition of CO<sub>2</sub> enables you to catch a broader range of blood seeking species as well as much higher numbers of the *Culicoides* species.

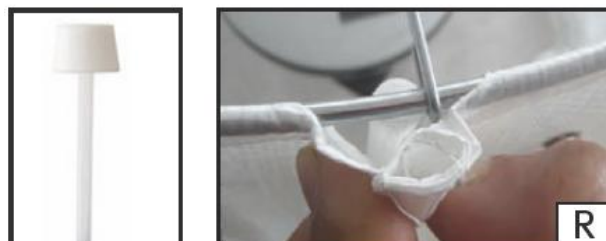
Various sources of CO<sub>2</sub> can be used. The CO<sub>2</sub> nozzle can be attached to a gas cylinder, any well insulated dry ice container, or another CO<sub>2</sub> source that fits your preference and that is placed away from the trap. For more information on the addition of CO<sub>2</sub> please visit our website:

[www.bg-sentinel.com](http://www.bg-sentinel.com)

CO<sub>2</sub> should be released by using the Biogents CO<sub>2</sub>-nozzle, which is customized for the BG-Sentinel trap. [Fig. B6] Recommended flow rates of CO<sub>2</sub> gas are between 200 and 500 ml/min.

### Attaching the 2011 Biogents CO<sub>2</sub> nozzle:

1. The lower end of the CO<sub>2</sub> nozzle is attached to the trap by inserting it into the pocket that is formed by the thick seam of the white plastic trap that is located on one of the openings for the mounting poles. **[Fig. B7]**
2. Before inserting the nozzle into the side of the trap, a hole can be cut in the white gauze covering to put the nozzle through for a better fit. **[Fig. B8]** Due to the special fabric used, the hole that is cut will not fray. Make sure the hole is in the correct location for the CO<sub>2</sub> nozzle.
3. Insert the nozzle and position it so that the CO<sub>2</sub> is released directly over the central opening. **[Fig. B6]**
4. Connect the opposite end of the tube that contains the orifice to your preferred CO<sub>2</sub> source.



If you do not use the Biogents Eisenhans Carbonation Control System to regulate the flow and minimize the output of CO<sub>2</sub> while optimizing its release, then the CO<sub>2</sub> flow restrictor is needed to minimize the flow of CO<sub>2</sub> from the preferred source. Two options are available: 70 ml/min and 175 ml/min flow rates.

## Safety Precautions

### General

- Children or persons unfamiliar with these instructions must not operate the equipment.
- The operator or user is responsible for accidents or hazards occurring to other people or to their property.
- Thoroughly inspect the area where the equipment is to be used and remove all potential hazards.
- When the trap is not in operation it should be stored in a safe, dry environment.
- Please only use accessories and spare parts that are recommended by the manufacturer. The use of other nets or gauze with the trap can significantly reduce the catch rate or even render it completely ineffective.

### Electrical

- When using a mains adapter always plug into a mains source that is in a safe, dry place (preferably indoors).
- Switch off and remove the mains adapter from the mains before all operations except insect removal.
- When using the car battery adapters always ensure these are connected correctly, bearing in mind any instructions from the car / car battery manufacturers.
- Regularly inspect the electrical cables for signs of damage and only use if in perfect condition. If damaged, the cable must be replaced.

### Attractants

- All use of attractants should be carried out according to the manufacture's recommendations for use and safety guidelines.

### Carbon Dioxide

- Many different sources of carbon dioxide are available. These have different hazards and safety precautions associated with them. Always follow the manufacturer / supplier guidelines for the source you have chosen.

If any further problems occur or you have any further questions please contact us at:

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