

LARVEN LAUSCHER

Device for monitoring and discovery
beetles and their larvae in cereals.



The problem

The federal biological institution estimates the annual grain loss in Germany due to pests to be 2%. The costs for fighting the pests are not insignificant and can only be lowered by early detection of infestation. Germany-wide, grain weevils (*Sitophilus granarius*) and lately the rice beetles (*Sitophilus oryzae*) are predominately responsible for the losses. Adult beetles are relatively easy to find by sifting of the grain. More difficult and costlier up to now, was control of larvae in the grain. Because the female beetles bore holes in grain kernels, lay eggs, then carefully close the kernels, infestation can hardly be detected. Larvae slipping out of the eggs develop hardly noticed and hollow out the kernels. If the hollowed areas in kernels are large enough, the loss of weight can be determined by bloating in water. Now with the new procedure, pest infestation can be determined long before grain is hollowed. Soon after hatching, noise caused by eating larvae is audible. This noise is very faint and not audible to the human ear without technical aid. With use of microphones and amplifiers however, infestation can be recognized indeed.

The microphone

The microphone reacts to body sound. The oscillations generated by the eating larvae are not being transferred through and by the air, but are directly being absorbed by the membrane of the microphone. The grain kernels must be next to the membrane. The microphone monitors not only those, but also those noises in the near surrounding. Kernels touching another, pass the sound. By sticking a microphone vertically in the grain, an area with a radius of approximately 50 cm can be controlled. Distance reduces the sound level. The microphone membrane can certainly withstand the lateral pressure caused by grain. Caution! Heavy pressure on the membrane by fingers, can destroy the sensitive instrument. The stick in microphone may be extended by rods, which can be screwed on.

The amplifier

To make the faint noises caused by larvae audible in an earphone, an amplifier, emitting very minor noise itself, is being used. The amplifier has a combined switch and sound regulator. The amplifier calls for a standard 9-Volt battery.

Battery change

Change of battery is necessary, when the noise of the instrument is significantly lower by fully turned-up volume, while the microphone is unplugged. Turn the instrument off, when changing battery. When changing battery, open the battery compartment with thumbnail or tip of a knife. Pull the plastic tab off the compartment edge and at the same time pull off the lid.

A 9-Volt accumulator may be used in lieu of a standard battery.

The earphone

The provided earphone is a so-called open type with foam-lined plastic flaps. Such earphones are light in weight and comfortable to wear. By very faint noises in near-by surroundings, it could be beneficial to use earphones with rubber flaps very close to the ear. They should have a resistance factor from 16 to 32 Ohms.

The appliance

In order to achieve noise protection, following action is recommended:

- 1) Plug in microphone and earphone.
- 2) Insert microphone in grain.
- 3) Put on earphone, turn on the device and regulate volume.
- 4) Reduce volume prior to moving microphone.

It hisses?

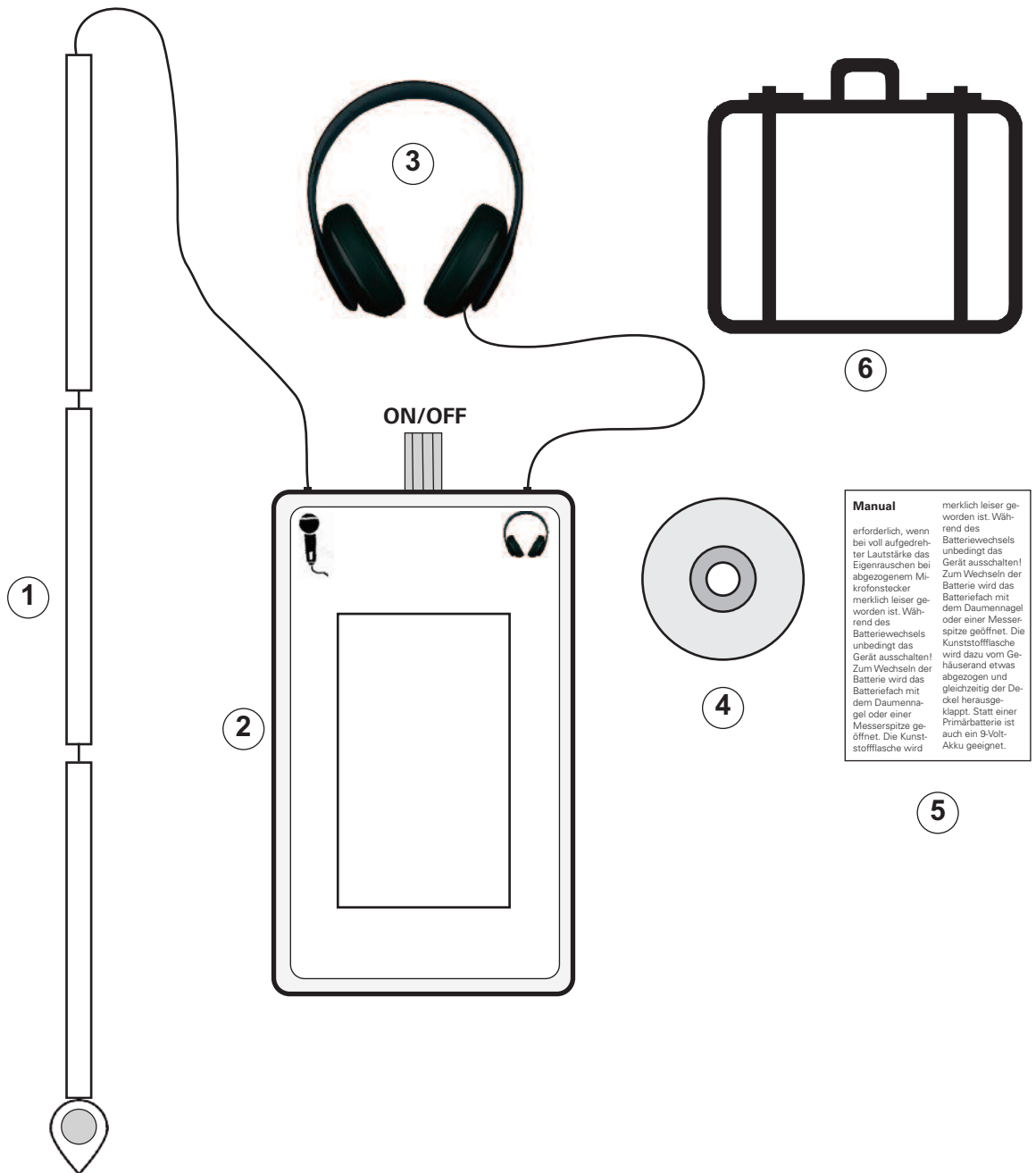
Increase in noise level coupled with the microphone responding to body sound emission can result in acoustic backlash. The microphone picks up the sound from the earphone. That sound is increased and fed into the microphone, causing hissing noise. Reducing the volume solves this problem. In large amounts of grain high volume amplification may be used for the most part.

Possible controlling procedures

- 1) Insert microphone in upper levels of grain containers or silos. It should be noted that larvae only eat during relatively warm climatic conditions. No activity is observed when temperature drops below 15°C. Therefore, no eating noise is being observed in chilled storage areas. However, this is not proof that the grain is free of pests.
- 2) For testing, fill an amount of grain in a bucket or paper sack and subject to a certain amount of heat. The larvae activity increases strongly with temperature. Maximum temperature should be 38°C. That temperature virtually insures larvae feeding on grain. Insertion of microphone can result in noise caused by grain settling. That noise will not completely disappear, but diminish after a while. However, the difference between that noise and feeding noise can be recognized.

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Manual

erforderlich, wenn bei voll aufgedrehter Lautstärke das Eigenrauschen bei abgezogenem Mikrofonstecker merklich leiser geworden ist. Während des Batteriewechsels unbedingt das Gerät ausschalten! Zum Wechseln der Batterie wird das Batteriefach mit dem Daumnagel oder einer Messerspitze geöffnet. Die Kunststoffflasche wird dazu vom Gehäuse etwas abgezogen und gleichzeitig der Deckel herausgeklappt. Statt einer Primärbatterie ist auch ein 9-Volt-Akku geeignet.

Larven-Lausher

Kit:

- 1 microphone stick
- 2 amplifier
- 3 stereo earphone
- 4 CD with audible examples
- 5 manual
- 6 all included in a case with formpad

Larven-Lausher
Code: S9009

Dirtributor:

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