



# Wardenaar peat profile sampler

## User manual



## Meet the difference

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## On these operating instructions



If the text follows a mark (as shown on the left), this means that an important instruction follows.



If the text follows a mark (as shown on the left), this means that an important warning follows relating to danger to the user or damage to the apparatus. The user is always responsible for its own personal protection.

*Text*

**Italic indicated text indicates that the text concerned appears in writing on the display (or must be typed).**

### 1. Introduction

Sampling undisturbed peat profiles in peat lands, is a very difficult activity. Digging and sampling profile pits in most peat lands is difficult (if not impossible) as they would immediately fill with water and the walls would slump.

Researching the ecology of peat land environments and the dynamics and stratigraphy of peat profile requires undisturbed samples, especially of the top layers, where most biological activity takes place.

The peat profile sampler, type Wardenaar, is an apparatus for sampling intact, undisturbed peat profiles in peat lands up to a depth of 1 meter. The peat profile sampler consists of a rectangular stainless steel box casing, divided lengthwise into two halves, with very sharp specially shaped cutting edges at the base.

The handgrip hinging with both halves allows both halves to be pushed into the soil alternately. A clamp mechanism on the grip allows the profile to be clamped in the sampler when it is extracted from the soil. A small diameter tube is fitted to break the suction of the sample.

The standard set contains, among other items: the peat profile sampler, tools, lever beam with support and a hand pump.

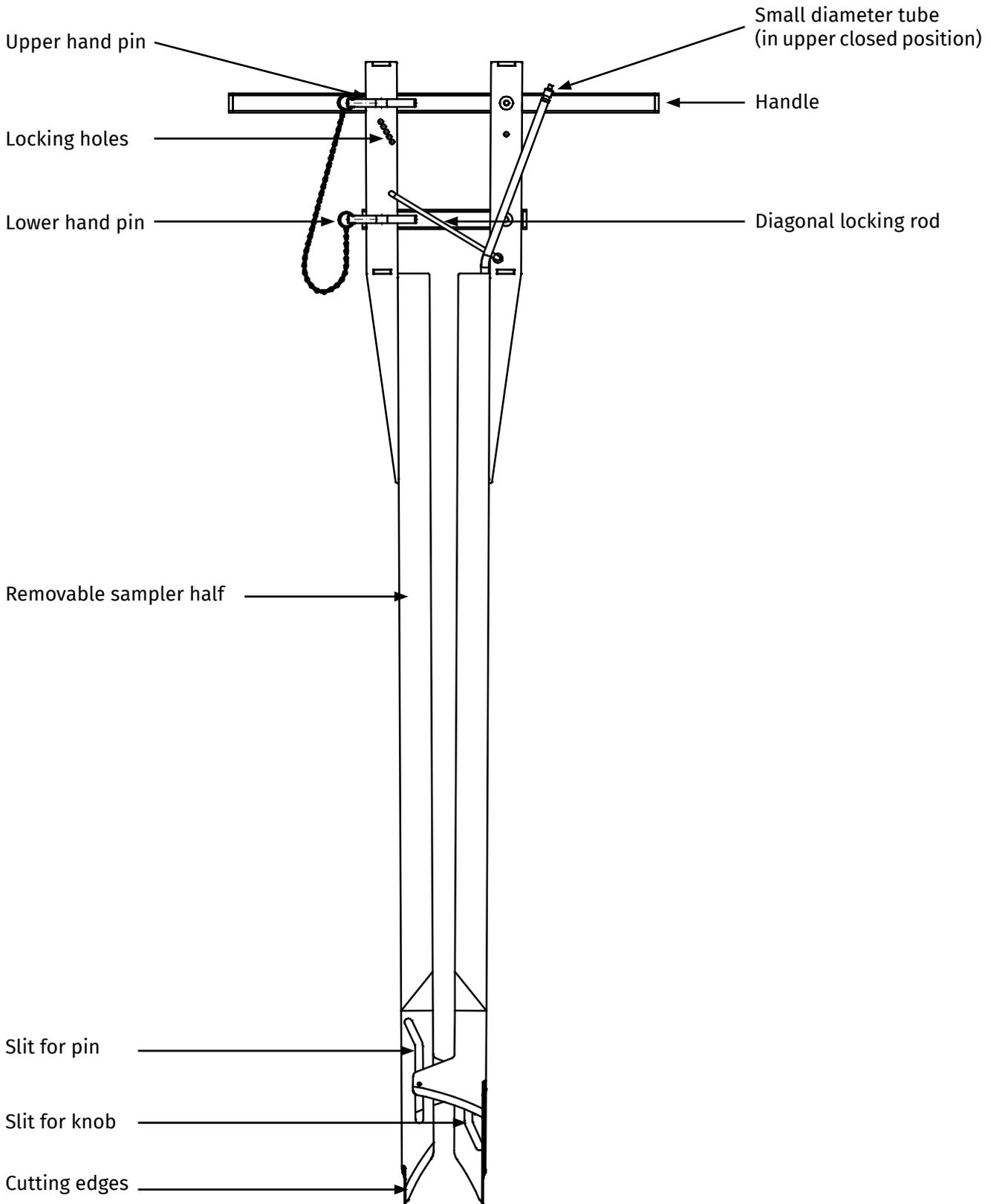


Wardenaar peat profile sampler



Wardenaar peat profile sampler set Prepared peat sample profile

## Sampler and components



Sampler in neutral position

## 2. Components of the sampler and their function

The small diameter tube is fitted in an inside corner of the sampler and is necessary to break the suction that occurs during extraction of the sampler from the peat (see figure on page 4). At the base it is closed in a particular position and can be opened by turning the tube 180°. It can also be moved upwards and downwards. The top-port will fit on a small hand pump (in which a valve-flap is necessary to build up pressure).

The diagonal locking rod is used to fix the sampler in the neutral position during transportation and during thrusting the sampler into the peat. It is also used to fix the sampler in the closed position when pulling the sampler out of the peat.



**A safety-cover can be used to protect the sampler from damaging during transport and also to prevent injuries when the sampler is not in use. Wear safety shoes and gloves.**

The two handpins of the hinges can be removed to open the sampler after it has been extracted from the peat. To open the sampler one also has to detach the lower connection (see figures A, B, C, D and E on page 6) for which safety-gloves are recommended.

Features to reduce compaction and disturbance of the profile are:

- a. Sharp bent cutting edges.
- b. The “walking-in” mechanism.
- c. The construction at the lower end of the sampler, causing the sampler to cut a somewhat smaller volume than would strictly fit inbetween the sampler halves which allows a relatively free movement of the cut profile inside the sampler.
- d. The sampler is slightly tapering (somewhat wider at the top side) which again allows a relatively free movement of the cut profile inside the sampler.

## 3. The sampling spot

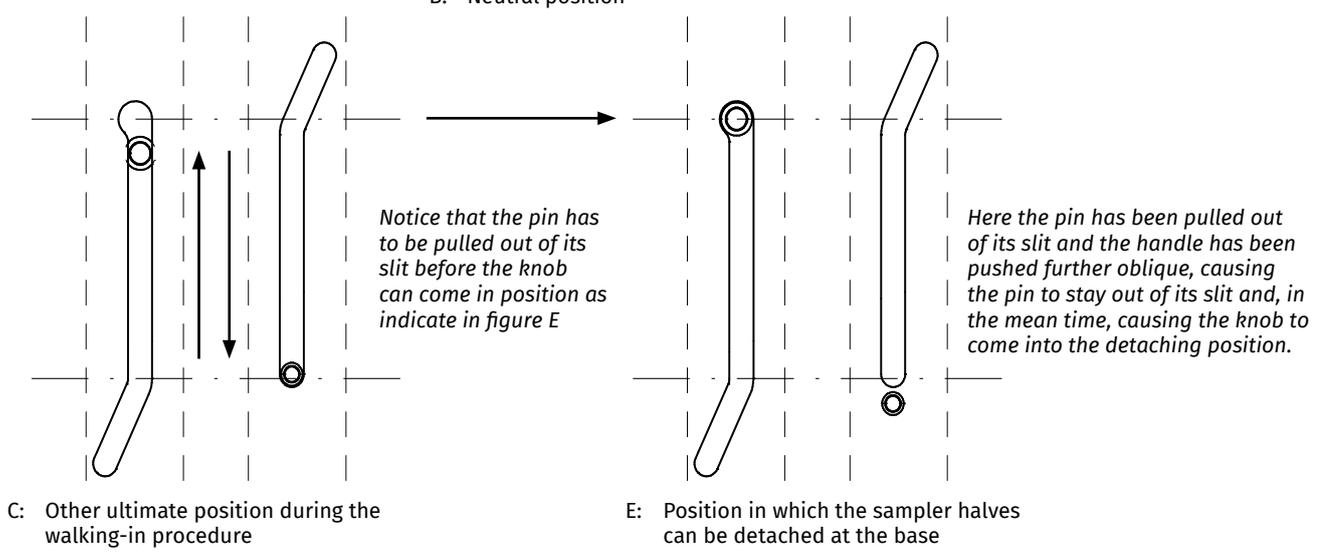
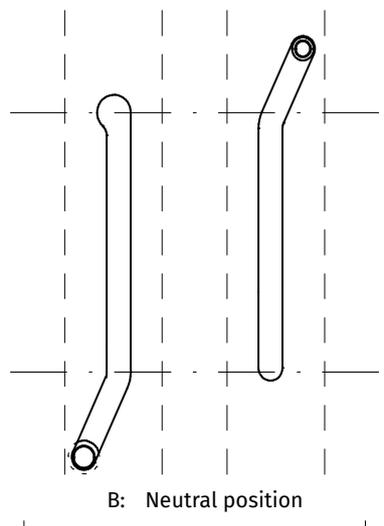
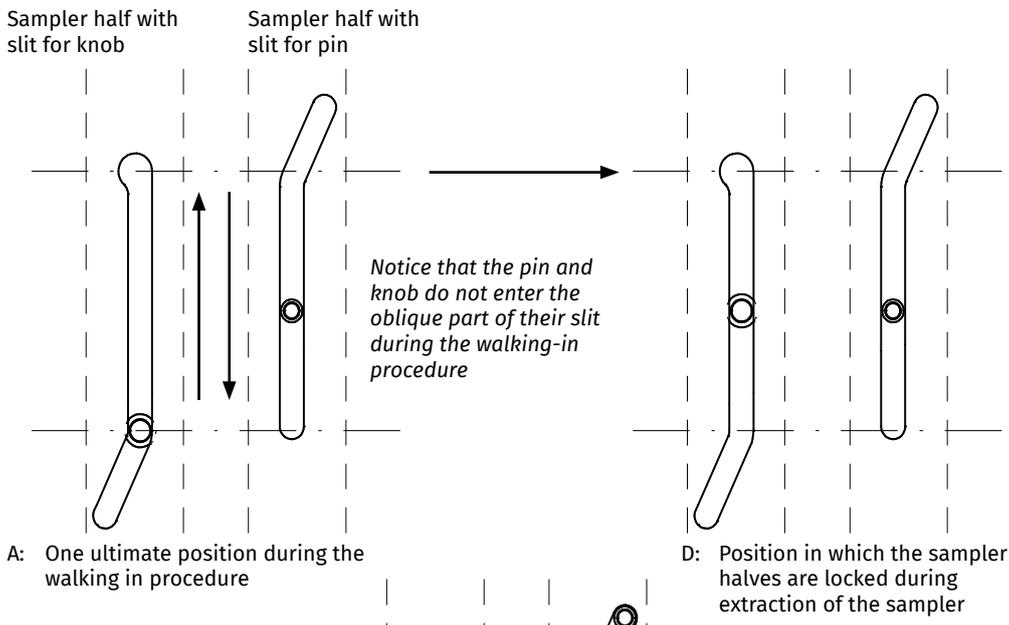
Before sampling, one should select a spot, free of any sound woody tissue (such as logs or roots over 2.5 - 3 cm in diameter) that might occur in the top 50 cm of the peat (by testing it with a probing (art. no. 011501) or a thin steel rod) as they will damage the cutting edges of the sampler.

### 3.1 To push the sampler in

After determining a suitable spot to cut a profile one should do the following:

1. Fix the sampler into the neutral position by the diagonal locking rod.
2. Move the small diameter tube upward (40-50 cm) and be sure it is in the closed position.
3. Lift the sampler high by its handle and aim vertically to the sampling spot.
4. Thrust the sampler down into the peat with great speed and force (but keep control). It should have cut through the upper 40-50 cm of the peat now. In case you hit too big a root or other obstacle, despite checking carefully for sound woody tissue in advance, you should check the cutting edges and repair them if necessary, using tongs and a fine file, see “4. Maintenance of the sampler”).
5. Detach the diagonal locking rod.
6. Start pushing down each side of the sampler in turn using the handle. Be sure the opposite half is not being pulled up by this action. Also be sure to work the sampler in by only small steps, as bigger steps might cause the sampler to narrow at the base (see figures A, B and C on page 6).
7. When pushing the sampler in by hand gets difficult at greater depth or by hitting a thicker root (even with

## Schematic explanatory drawings of the supporting, locking and detaching mechanism at the base



the help of a second person), one can kick the handle using ones foot or use an impact absorbing hammer (art. no.: 040505) to force each sampler halve to advance further down.

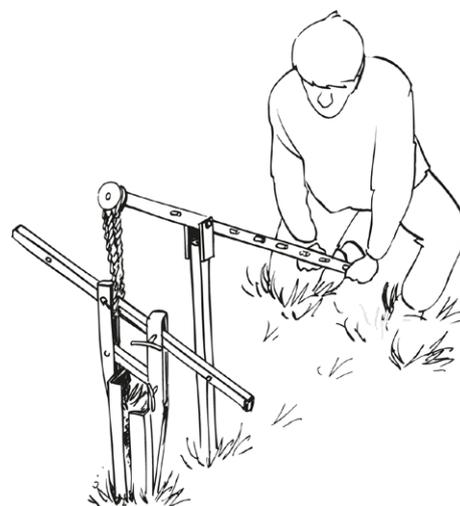
8. Put the sampler in the neutral position (see figure B) and push down the small tube in the closed position.

### 3.2 To pull the sampler out

1. Push the right half down far to lock the sampler at the base (see figure D, page 6) and fix it in that position using the diagonal bar and one of the holes. In certain materials (like humus or drier peat) this locking of the sampler might be not necessary, and could damage the fragile base of the sample.
2. Open the tube by turning it 180°, attach the hand pump and start pumping untill the pressure drops suddenly, indicating the unplugging of the tube. In drier or denser peat-types this might be impossible, meaning that you have to start pulling without unplugging it first. It might unplug by itself while pulling and also might not be plugged at all. In wetter peat-types the unplugging is usually easier and can be noticed by pressure-drop and air bubbles coming to the surface.
3. Detach the hand pump.
4. To make pulling easier one could pull the sampler in different directions laterally to widen up the surrounding peat somewhat, but this might not be necessary especially when a second person is available to help pulling the sampler out.
5. Slowly pull out the sampler (more comfortable by two persons or by using the lever beam), allowing the air to stream through the tube underneath the sampler. Pulling too hard might cause breaking of the core and loosing some material.



**It is best to pull with your legs instead of your back.  
Or use the lever beam with support.**



*Pulling out the sampler by means of lever beam and support*

6. Lay down the sampler (the removeable half, which hinges with removeable handpins, upward) and detach the diagonal bar.
7. Push the handle into the opposite ultimate position (see figure C) suddenly by hitting the handle with your hand (this is to loosen the upper half of the sampler from the peat core if necessary). In certain materials (like humus or drier peat) this loosening might be not necessary and could possibly damage the fragile base of the sampler.
8. Pull out the lower removeable handpin and put on your safety-gloves.
9. Beware of the sharp cutting edges and determine on which side the sampler halves are attached by a pin and on which side they are attached by a knob and carefully pull the pin out of its slit by pulling that side slightly lateral (with your hands or by using some knife) (see figures C and E).
10. Now the handle can be pushed somewhat further oblique. Only if you do this, the pin comes in a position that it cannot flip back into its slit and the knob comes in the position that it can be detached (see figure E).
11. With small movements of the handle, simultaneously with slightly widening and narrowing of the sampler halves at the base, one will find the position in which the knob will detach by itself.
12. Open the sampler and, if you wish, pull out the other pin as well to get rid of the upper half of the sampler to make investigation of your profile (after cleaning it up with a knife) easier and safer.

## 4. Maintenance of the sampler



**To keep the sampler properly working one should keep the cutting edges in shape by repairing damages (like bendings) immediately.**

Severe bluntness should be dealt with by using tongs, a fine file or a whetstone whichever is necessary. For good results one should check the cutting edges regularly (e.g. at the beginning of each day of use) and use tongs, file or whetstone to sharpen if necessary. A blunt sampler (or locally blunt sampler) will cause more disturbance and compaction of the peat.



**Be careful with the sampler and always cover the sharp edges with a safety-cover (for safety and protection from damage).**



**Never use an ordinary hammer to cut through sound woody tissue: in case further penetration is impossible use the special impact absorbing hammer (art. no.: 040505). If that doesn't help and you still want to go deeper, try again on another sampling spot.**



**Always use safety gloves when opening the sampler or during other activities that might be dangerous in that respect (like cleaning the sampler).**

## 5. Information or suggestions

A note has been published in the Canadian Journal of Botany (1987) 65: 1772-1773. In case you have or need information or suggestions about field applications or operational problems, we are very interested to hear them and they can be addressed to Eijkekamp Soil & Water.