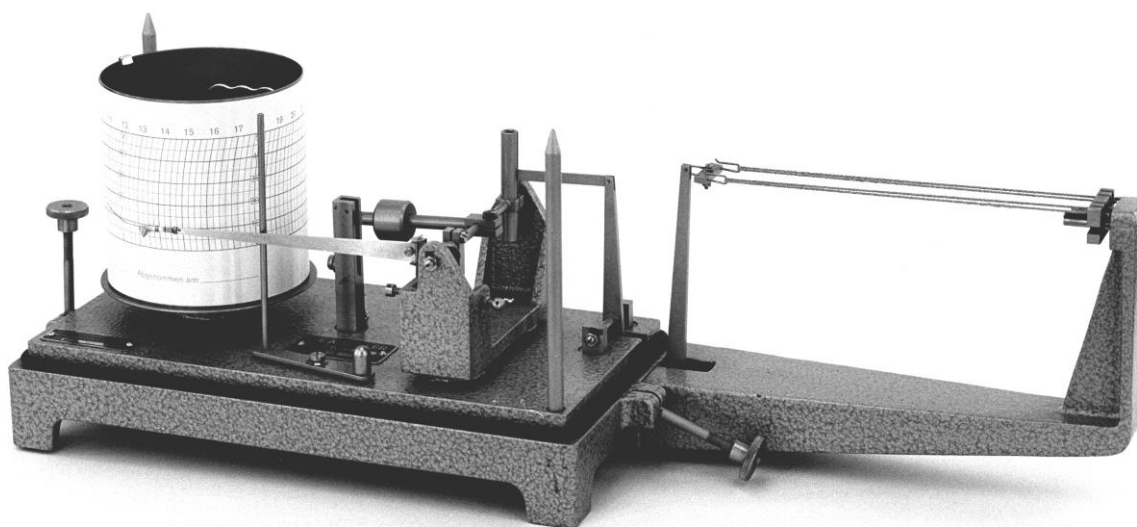


## SURFACE-WETNESS RECORDER

### Woelfle-type



The duration of moistening of parts of plants by rain or dew plays an important role in agricultural meteorology and especially in fighting agricultural pests. Certain dangerous spores as, for instance, those of fuscladium are unable to develop and penetrate a plant after being deposited on its leaves by the wind unless the plant has been moistened by water for a certain period of time. For this reason, an application of fungicides and insecticides will be necessary and useful only when the critical duration of wetness is reached, and the danger of an infection really exists.

The Woelfle-type surface recorder makes it possible to accurately determine the duration of these periods of moistening and, thereby, to turn the "blind battle" conducted up to now at regular intervals into an aimed method which will increase the profitableness of crops.

The duration of surface-wetness is the total of duration of precipitation and duration of drying. The latter is dependent upon all of the factors of evaporation, i. e., deficit of saturation, ventilation, radiation, etc. The duration of drying may differ considerably among the different leaves of the same plant. Direct measurement of surface-wetness on a leaf is awkward and difficult to carry out.

In the surface-wetness recorder the plant is represented by a receiving element which generally consists of a number of hempen strings extended horizontally in a harp-like fashion. These contract spontaneously when they become moist and regain their original length after drying. Through a lever system this motion effects corresponding deviations of the pen so that the recording clearly shows the duration of each individual period of moistening, i. e., its beginning as well as its end. The course of the curve moreover makes it possible to determine whether the moistening was caused by rain, dew or wet fog (see fig. 2).

The drum moves by means of a built-in clockwork; a period of rotation of one week is usually found to be suitable.

The instrument is of a robust rainproof design so that it may be set-up unprotected in the open air. As the forces during the moistening of the hempen strings are relatively intense, the lever system could be designed in a simple rugged way. The receiving element is arranged laterally in such a manner as to be freely exposed to precipitation and not to be hindered by the casing. In order to replace the chart, the hood of the casing is taken off in an upward direction after loosening two lateral clamping screws. The recording can be seen from the outside through a glasswindow.

The surface-wetness recorder should be exposed to appear. the same wind and radiation conditions as the leaves which are to be observed.

Design of the holding device permits easy replacement of the hempen strings by a few manipulations and allows for variation in order to adapt their sensitivity to the different types of plants. The time of drying of a hempen string of appear. 0.9 mm thickness corresponds approximately to the drying time of fruit-tree leaves while the drying time of leaf stems near the ground (beets for instance) may be copied with a hempen string of about 1.5 mm diameter.

It is recommendable to exchange the hempen strings after each vegetation period as the influences of the weather gradually change the characteristics of the strings so that the amplitude of the pointer's motion is no longer warranted.

As the hempen strings are held tense by means of a counterweight and offer the wind only a slight surface the recording will not be disturbed in any way even in the case of a storm. For this reason there is no need of additional damping devices the effectiveness of which, as experience has taught, is rather imperfect. Furthermore, they depend on the viscosity of the damping liquid and thus also on the temperature. In this respect the instrument differs favourably from instruments which determine surface-wetness by weighing a test body. It is easy to see that in this case variable wind pressure acting on the test body may be much higher than the weight of the quantity of liquid taken on.

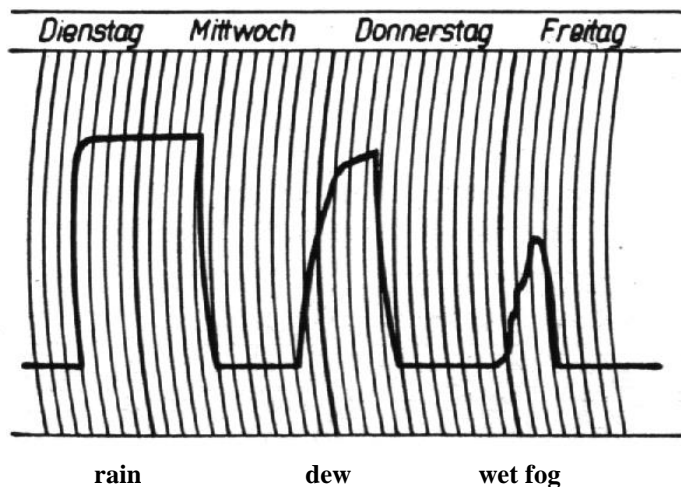
Due to these favourable qualities, the surface-wetness recorder ought to be well suited also as a dew recorder as long as one is prepared to characterise the fallen dew no longer by its weight

but by the duration of moistening. A restriction of this kind is reasonable since the quantity of liquid actually condensed when the dew point is not reached, depends largely upon the kind, size, shape and structure of the respective receiving body no matter whether the latter be chosen in some natural way or at random as test body for measuring apparatus.

Even a quantitative measurement of dew precipitation actually furnishes only relative values of the potential availability of condensable liquid. It seems obvious, therefore, that the duration of moistening could be taken as relative value.

**Bibliography:**

Berichte des Deutschen Wetterdienstes Nr. 41 (Band 6): "Meteorologische Meßgeräte und Voraussetzungen für den Schorfwanddienst" von Fritz Schnelle und Wilhelm Beuer



**No. Specifications**

- 64b** Surface-Wetness Recorder, Woelfle type, in rainproof metal casing  
Division of diagram: 0 ... 50 relative  
Recording drum: 93 mm diameter x 93.3 mm height  
Recording height: 50 mm  
Rotation of drum: 1 day or 1 week,  
Running time: 9 days  
Dimensions (mm): 495 length x 140 width x 170 height  
Weight: 2.8 kg  
Accessories (no additional cost):  
1 Set of charts, 1 Pair of spare hempen strings, 1 fiber pen

**Spares and Supplementary Parts**

- Spare recording drum with internal clock for rotation of
- 901d** 1 day  
**901w** 1 week  
**64bs** 1 Pair spare hempen strings of 0.9 diameter  
**64bt** 1 Pair hempen strings of 1.5 diameter  
**193** 1 Set of 100 recording charts for daily rotation, paperfeed: 11.2 mm/h  
**187** 1 Set of 100 recording charts for weekly rotation, paperfeed: 1.67 mm/h  
**78wf** 1 Fiber pen  
**78q** 1 Metal-pen  
**1095v** 1 Bottle recording ink

**DR. ALFRED MÜLLER**  
**METEOROLOGISCHE INSTRUMENTE KG**  
Chausseestraße 39 / 42c  
D-15712 Königs Wusterhausen

**Tel.:** +49 3375 9025-32  
**Fax:** +49 3375 9025-36  
**e-mail:** info@meteomueller.de  
**www.rfuess-mueller.de**