

"KELWAY® PRODUCTS"

KELWAY SOIL® ACIDITY AND MOISTURE TESTER MODEL HB-2

READ these instructions BEFORE USE especially sections III, IV, V, and VI.

I. Description

The Kelway Model HB-2 provides the ability to make on the spot-in the field or in the lab-tests for soil acidity in moist soil. No power sources are needed. Readings are shown on 2 meter scales, pH and moisture. Accurate readings can be obtained by following instructions and long unit life is insured by proper handling.

II. Brief Theory

The Kelway Soil Acidity Tester, Model HB-2, measures pH (degree of acidity) and moisture content (% relative saturation). The pH reading utilizes a tiny flow of current through the two metal plates located on each side of the unit's housing. Since the current flow is so small, these metal plates must be kept clean (*please refer to section VIII.A*). Because the HB-2 utilizes metal plates instead of the conventional "Glass Electrode" commonly used in laboratory pH testers it has certain advantages. Primarily there is the portability factor plus ease and speed of testing and the complete elimination of "buffer solutions". As a result you don't have to be a "scientist" to use an HB-2! However, the use of metal plates can cause some confusion if you try to test highly saline alkaline soil. The metal plates can be fooled by the presence of the soluble salts in such soil and can give erroneous readings. The HB-2 should not be used in this type of soil. Since most soils are acidic (and tend to increase in acidity as time passes) this is not a common problem. If you are in an area of known saline, alkaline soil, you must correct the problem prior to using the HB-2.

III. Preparations Before Use and Some DO and DON'T Tips

- A. The HB-2 has been quality control checked before shipment. If for some reason the meter indicator is not pointing to a pH reading of 7 on the upper scale, refer to the section entitled "Calibration" before proceeding.
- B. READ ALL INSTRUCTIONS BEFORE USING THE HB-2.
- C. Never force or jam HB-2 into hard earth.
- D. Do not measure liquids. This unit has not been designed to measure liquids. If liquids enter the unit and contact the circuitry, damage can occur which will not be covered by the guarantee. By liquids we mean water as well as acids.
- E. Do not attempt to remove the metal tip. If it loosens, tighten it by turning it clockwise. Do not grasp it directly with a metal plyers. Protect it from damage with a piece of non slip rubber or similar protection before tightening.
- F. Avoid using the tester near magnetic objects.
- G. Do not hold the unit with fingers on the metal plates. Fingerprints are greasy and will reduce the flow of current. Always keep the metal plates clean. See "Maintenance Tips"

IV. Instructions for Use to Measure pH

- A. Tester's plates must be chemically clean and totally free of contamination. The metal plates must be rubbed clean before use with the Kelway Conditioning Film provided. See "Maintenance Tips".
- B. Soften the soil in the spot to be tested. Break up pieces if it is hardened. Remove grass, leaves, pebbles and other debris.
- C. Gently insert tester vertically into the softened soil so that the metal plates are fully covered. Press the soil tightly around the tester so that the metal plates are in close contact with the soil.
- D. Read the pH on the upper scale. Generally the tester indicator needle makes a swing to the right and then drops to the correct pH reading, where it stabilizes in 2 to 3 minutes. Your proper reading should be made at the time of stabilizing. A little practice will help you to get correct readings easily.
NOTE: Reading pH requires some soil moisture to be present for proper operation. If the tester's indicator needle does not deflect during the 2 to 3 minute pH test period the soil may need moisture. Moisten the soil slightly. Distilled water is preferable. Tap water introduces its own pH and generally requires several hours of stabilizing before you can make your reading.
- E. After use, wipe the plates clean with a paper towel to remove all dirt particles. Remember to use the Kelway Conditioning Film before your next reading. See "Maintenance Tips"

V. Instructions for Use to Measure Moisture

- A. Tester's plates must be chemically clean and totally free of contamination. The metal plates must be rubbed clean before use with the Kelway Conditioning Film provided. See "Maintenance Tips"
- B. Soften the soil in the spot to be tested. Break up pieces if it is hardened. Remove grass, leaves, pebbles and other debris.
- C. Gently insert tester vertically into the softened soil so that the metal plates are fully covered. Press the soil tightly around the tester so that the metal plates are in close contact with the soil.
- D. Press the button to read moisture content on the lower scale. Hold the button in the depressed position. This also requires a 2 to 3 minute stabilization period.
- E. The reading you are obtaining is percent relative saturation. It is not percent moisture by weight. Each type of soil has its own FIELD CAPACITY — meaning its own ability to hold water — after it has been irrigated and drained. This could be termed "relative saturation"
Examples: Fine Sand would hold about 32%.
Loam might hold 45%.
Clay could hold 65%.

At these ranges each of these soils would be saturated or at their Field Capacity and the HB-2 would read 100%.

- F. After use, wipe the plates clean with a paper towel to remove all dirt particles. Remember to use the Kelway Conditioning Film before your next reading. See "Maintenance Tips"