

***Test-then grow the Best!***



**SOIL-PH &  
HUMIDITY  
TESTER**

Patent No. 193478  
533321

# SOIL TESTER

## Relations between Farm Produce and Soil

To Make the soil ideal for absorbing fertilizers it is necessary to neutralize the soil by compounding neutralizer agents such as lime, etc. However, should lime or other property be sprayed in too large quantities, it causes what we call "dearth of manganese" with the end result that the soil itself entirely loses its proper property as "soil fertilizer"

In case of spraying lime on the soil, it is most advisable that the soil's hydrogen ion, or pH be detected first to determine the appropriate quantity of lime needed for neutralization. To this end it is recommended to use this simple soil pH tester, for on-the-spot pH detection use. Users never fail to be satisfied with the results.

By neutralization it means that the soil is made into a condition of pH7 in terms of hydrogen ion content, but pH7 does not always mean the best condition. The optimum pH index is more or less different according to the produce involved, and the respective optimum pH indexes by produce are as per the following tabulation:

Chart No. 1 - List of Optimum pH Index for Some Farm Produces

pH 7-8	Barley, Spinach, Sugar Beet, Ground-Nuts, Onions, etc.
6-7.5	Rye, Wheat, Peas, Sweet Potato, Turnip, Clover, Egg-Plant, Burdock, Tobacco, etc.
5.5-7	Soya Bean, Rape(cole), Red Bean, Radish, Carrot, Tomato, Corn, etc.
5-6.5	Rice-Plant, Dry-Land Rice, Potato, Taro, etc.

To judge if the proper quantity of lime has been sprayed for neutralization, detection is required to be made about a week after the lime spraying. Volume of lime to be sprayed for neutralization varies according to quality of the soil involved.

Mr. Arny's (phonetic) list is given below for reference.

Chart No. 2 - The quantity of lime needed to raise, by one unit pH index of soil toward Alkali side or Alkalinization (10,700 square feet (990 square meters of 1/4 acre))

Nature of Soil	In case of Weak Humus	In case of Medium Humus	In case of Rich Humus
Sandy Soil	64 kgs. (140 lbs)	128 kgs. ( 280 lbs )	200 kgs. ( 440 lbs)
Minute Soil	95 kgs. (210 lbs)	188 kgs. ( 415 lbs )	290 kgs. ( 640 lbs)
Sand Soil	188 kgs. (415 lbs)	375 kgs. ( 700 lbs )	450 kgs. (1,000 lbs)
Medium Soil	315 kgs. (700 lbs)	375 kgs. ( 825 lbs )	469 kgs. (1,030 lbs)
Sticky Soil	375 kgs. (825 lbs)	469 kgs. (1,030 lbs )	533 kgs. (1,170 lbs)
Humus soil in case humus volume is 15% upr			
abt. 450 kgs. (1,000 lbs) - 500 kgs. (2,000 lbs)			

### Example:

Supposing that the soil reaction is at pH4 and is of a sandy nature, which is low in humus, to elevate the pH to pH6.5, the quantity of lime needed, according to tabulation above, (pH6.5 - pH4 = 2.5) is 2.5 to make the soil alkali.

This means, in terms of practical figures, that the quantity of lime needed to neutralize the soil, measuring 10,700 square feet (990 square meters or 1/4 acre), 10cm deep, is -188 kgs. (415 lbs.) x 2.5 = 470 kgs. (1,038 lbs.)

### How to Use

1. Taking the tester out: and see that the pointer needle points to pH7. (Fig. 1)
2. The electrode is very sensitive, therefore before and after using wash off dirt and dust on the surface of the electrode and wipe with a dry cloth clean. (Fig. 2).
3. Insert the tester into soil vertically which is holding about 50-70% moisture and tread down the surrounding soil by foot tightly in order to let contact enough with soil and electrode. (Fig. 3). When soil is dry accurate pH index cannot be detected in which case it is advisable that water from river or well is properly sprinkled to the above moisture percentage and wait about 2 hours to measure.
4. The pointer needle settle soon (about 3 minutes) and the stabilized position is pH index. (Fig. 4)
5. In case of measuring humidity, push the button and can get humidity index. (Fig. 5). After using keep to wash off dirt and dust on the surface of the electrode and wipe with a dry cloth clean. (Fig. 2).



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5

### Features

1. Being of electric generation system with the earth, no chemical, distilled water, and/or electric power source such as storage battery, etc. is needed.
2. Measuring is most simple, the desired pH index being shown by merely inserting the meter into soil.
3. The quantity of lime to be applied is readily ascertained.
4. Compact in size, elegant in style and handy to carry.

### Care to be Taken in Handling and Measuring

1. When it is desired to put pointer needle to pH7 position, take the lid and glass off and carefully turn the screw on the under part right and left and set correct position. Do not turn strongly.
2. Insert the tester vertically and let the soil contact compactly with the electrode by foot. If the soil does not come in contact completely with metal parts on both of the tester, the pointer needle vacillate left and right and will not settle.
3. Keep the electrode clean and free from rust. When oxidation takes place on surface, sensitivity becomes weakened and the needle will not point to accurate pH and humidity indexes. When rusty, polish with sand-paper or sand before and after using.
4. If high voltage electric pole, etc. be near the soil, avoid to measure in such position since it is probable that the pointer needle will point to higher pH and humidity than the true indexes, in relation to earth electric current, etc.
5. Being designed to harness soil's electricity generating power for its functioning, index comes more or less different depending on pressure by foot and moisture degree, and so it is ideal if average index figure is sought by doing measuring 5-6 times.
6. Handle carefully and never drop, oscillate strongly.

Manufacturer: TAKEMURA ELECTRIC WORKS, LTD.

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