

## Acid Soil Rapidly Available Phosphorus Content Assay Kit

**Note:** Take two or three different samples for prediction before test.

**Operation Equipment:** Spectrophotometer

**Cat No:** BC2950

**Size:** 50T/48S

### Components:

Extract solution: Liquid 80 mL×1 bottle, store at 4°C.

Reagent I: Powder×1 bottle, store at 4°C (protected from light). Dilute with 15 mL of distilled water before use. Unused reagent can be stored for one week at 4 °C.

Reagent II: Powder×1 bottle, store at 4°C (protected from light). Dilute with 15 mL of distilled water before use. Unused reagent can be stored for one week at 4 °C.

Reagent III: Liquid 15 mL×1 bottle, store at room temperature.

Standard: Liquid 1 mL×1 tube, 10 μmol/mL standard phosphorus stock solution, store at 4°C.

**Phosphorus fixing reagent:** Prepare reagents for determining phosphorus content: make solution as the volume ratio of H<sub>2</sub>O: Reagent VI: Reagent VII: Reagent VIII =2:1:1:1, which should be light yellow. It shows lose efficacy if color is changed, phosphorus pollution if color is change to blue. Prepare the reagent when it will be use.

**Note:** It is better to use new beaker, glass rod and glass pipettes, or disposable plastic ware when making reagent to avoid phosphorus pollution.

### Product Description:

Rapidly available phosphorus is a phosphorus component that can be absorbed by plants in the soil, including all water-soluble phosphorus, partially adsorbed phosphorus, easily mineralized organic phosphorus, and some dissolved precipitated phosphates.

Extraction of acid-soluble phosphorus and adsorbed phosphorus by double acid method. In acid environment the content of rapidly available phosphorus can be calculated by molybdenum blue method.

### Required reagents and equipment:

Spectrophotometer, centrifuge, water bath, analytical balance, transferpette, 1 mL glass cuvette, distilled water and 20 meshes sieve.

### Procedure:

**I. Preparation of sample:** Fresh soil samples are naturally air-dried or oven-dried at 37°C, pass through a 20 mesh sieve. Take 0.05 g of air-dried soil sample and add 1 mL of extraction solution. Shake and mix thoroughly, then incubate at 25°C water bath for 1 h, centrifuge at 10000 g for 10 minutes at room temperature, take supernatant to be tested.

### II. Determination procedure:

1. Preheat spectrophotometer for 30 minutes, adjust wavelength to 660 nm, set zero with distilled water.

2. Standard: Dilute the 10  $\mu\text{mol/mL}$  standard solution to 2, 1, 0.5, 0.25, 0.125, 0.0625, 0.03125  $\mu\text{mol/mL}$  with extraction solution.

3. Add reagents in 1.5 mL EP tubes as the following:

| Reagent ( $\mu\text{L}$ ) | Test tube (T) | Standard tube (S) | Blank tube (B) |
|---------------------------|---------------|-------------------|----------------|
| Sample                    | 100           | -                 | -              |
| Standard                  | -             | 100               | -              |
| Extract solution          | -             | -                 | 100            |
| Phosphorus fixing reagent | 900           | 900               | 900            |

Mix thoroughly and standing for 30 minutes at 25°C.

Add the mixture into 1 mL glass cuvette, and detect the absorbance value of each tube at 660nm and noted as  $A_T$ ,  $A_S$ ,  $A_B$ .  $\Delta A_T = A_T - A_B$ ,  $\Delta A_S = A_S - A_B$ . Blank tubes only need to be tested 1-2 times.

### III. Calculation

1. Standard curve.

The concentration of standard solution as x-axis,  $\Delta A_S$  as y-axis, obtain the equation  $y=kx+b$ . Take  $\Delta A_T$  to the equation to acquire x ( $\mu\text{mol/mL}$ ) value.

2. Calculation:

$$\text{Rapidly available phosphorus } (\mu\text{mol/g weight}) = x \times V_S \div (V_S \times W \div V_{ST}) = x \div W$$

$V_S$ : Sample volume, 0.1 mL;

$V_{ST}$ : Extract solution volume, 1 mL;

W: Soil sample weight, g.

#### Note:

1. Prepare the phosphorus fixing reagent when it will be used. The normal color of this liquid is light yellow, and it will be invalid if it changes color or turns blue.
2. This method has the characteristics of trace, sensitive and rapid. It is better to use new beaker, glass rod and glass pipettes, or disposable plastic ware when making reagent to avoid phosphorus pollution.
3. Test immediately after color rendering.
4. If  $\Delta A > 1$ , the sample can be determined after being appropriately diluted with Extract solution. When calculation, multiply the calculation formula by the corresponding dilution factor.

#### Note:

1. The working fluid (phosphorus fixing agent) should be prepared and used now. The normal color is light yellow. If it changes color or turns blue, it is invalid.
2. This method has the characteristics of trace, sensitive and rapid. Therefore, the test tube or EP tube and other test equipment used for determination are strictly phosphorus free.
3. It should be detected immediately after color development.
4. If the absorbance value exceeds the linear range, the sample size can be increased or diluted before the determination.

**Related Products:**

|               |   |
|---------------|---|
| BC3020/BC3025 | Soil Available Boron Content Assay Kit                        |
| BC2960/BC2965 | Neutral/Alkaline Soil Available Phosphorous Content Assay Kit |
| BC4030/BC4035 | Soil $\beta$ -1,4-Glucanase Activity Assay Kit                |
| BC4020/BC4025 | Soil Leucine Arylamidase(S-LAP) Activity Assay Kit            |
| BC0240/BC0245 | Soil Saccharase(S-SC) Activity Assay Kit                      |
| BC3100/BC3105 | Soil Hydroxylamine Reductase Activity Assay Kit               |

**Technical Specifications:**

The detection limit: 0.0061  $\mu\text{g/mL}$

Linear range: 0.03125-6  $\mu\text{g/mL}$