

Monitoring soil health

Why regular soil testing is important to help your garden thrive.

HEALTHY GARDEN

By MELISSA LOK MEI TENG

FERTILISERS play a crucial role in plant health and are the primary source of essential nutrients for plant growth. However, its over- or underapplication can have detrimental effects.

Excessive fertiliser use can lead to nutrient losses, potentially harming the environment, whereas insufficient fertilisation can result in poor plant growth.

The key to successful fertilisation lies in determining the correct amount for specific soil conditions, which can vary based on the soil type and previous gardening practices. This is why regular soil testing is of paramount importance in maintaining optimal soil health for your garden.

Although professional laboratory testing provides the most accurate and reliable soil analysis, it can often be impractical for hobby gardeners because of its cost and time-consuming nature. Fortunately, several simple and cost-effective methods allow gardeners to assess the soil quality in their own backyards.

Soil acidity

One of the fundamental aspects of soil health is the pH, which measures the acidity or alkalinity of the soil. In Malaysia, soils tend to be generally acidic, with a pH of less than 5. Soil pH is crucial because it directly affects nutrient availability to plants. For most plants, a pH range of 5.5 to 6.5 is generally considered ideal, although this depends on the type of plant.

To check soil pH at home, begin by vigorously shaking a mixture of 10g of soil with 25ml of water (1:2.5 ratio) for one minute and allowing it to settle. Then use a litmus pH paper or pH meter to determine the pH level of the soil solution.

Soil nutrient content

Another critical factor of soil fertility is its nutrient content, particularly the levels of nitrogen, phosphorus and potassium (collectively known as NPK).

These nutrients are essential to plant growth and health.

Nitrogen promotes lush green foliage, phosphorus supports root development and flowering, and potassium enhances plant health and disease resistance.

Imbalances in these nutrients can lead to various problems, including stunted growth, poor



In the colorimetry-based rapid test for nitrogen, the increasing intensity of pink colouration indicates higher levels of soil nitrogen. – MELISSA LOK MEI TENG

yields and increased susceptibility to pests and diseases.

Rapid soil tests

In recent years, affordable rapid soil tests have become increasingly available and can be purchased online. These tests generally fall into two categories: colorimetry-based tests and electronic NPK sensors. Colorimetry-based tests involve mixing soil with chemical reagents and observing colour changes against a reference chart. The intensity of the colour often corresponds to nutrient levels, with darker colours indicating higher concentrations.

Electronic NPK sensors are portable devices designed to directly measure nutrient levels in the soil. These sensors often use soil electrical conductivity (EC) as a key indicator. Soil EC measures the ability of soil water to conduct electrical currents and is influenced by both the presence of salts and dissolved nutrients.

In Malaysian soils, EC readings are typically low, often below one deciSiemens per metre

(dS/m). When soil EC exceeds 4dS/m, it often signifies high salinity levels. Such high salinity can stress plants by impeding water absorption and disrupting the beneficial microbial activity in the soil.

The principle behind these sensors is that higher EC readings generally correlate with higher ion concentrations in the soil solution, which can indicate elevated nutrient levels.

However, it is crucial to note that EC measurements alone cannot differentiate between the effects of salinity and nutrient concentration. Therefore, readings from electronic NPK sensors may require additional context or complementary measurements for a better understanding of soil nutrient levels.

Advantages and limitations

Although rapid soil tests offer the advantages of quick on-site results and cost-effectiveness over time, they have limitations. They are less precise than laboratory tests and often focus only on a very limited range of nutrients (such as NPK).

To obtain the most of rapid soil tests, it is important to follow instructions carefully, test multiple locations in the garden, and maintain consistent testing conditions. Although these rapid tests are useful for general estimates, occasional laboratory tests are still necessary for a more detailed analysis.

As technology continues to advance, it is likely that rapid soil tests will become more accurate and comprehensive. By combining both rapid and laboratory testing methods, gardeners can make more informed decisions about soil management, ultimately leading to healthier soils and thriving plants.

Understanding your soil is the first step towards creating a vibrant, productive garden.

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