



# LaMotte

## Soil Test Kit Garden Guide



[www.lamotte.com](http://www.lamotte.com)



## Visual Symptoms of Element Deficiencies

Mineral	Needle Color	Stem Appearance	Roots
Nitrogen deficiency	Light or pale green color	Slender, may be succulent	Small roots
Phosphorus deficiency	Yellow color	Short, slender stems	Small roots
Potassium Deficiency	Cotyledons red or chocolate brown	Shoot dieback; stunted growth	Small roots, poor growth





## Nutrient Requirements of a Seedling:

The minimum quantity of nutrients the plant will absorb to attain the desired morphological size and physiological condition.



## Soil Analysis:

The major tool for determining the range of critical and acceptable values of soil fertility, and for maintaining optimum levels of nutrients.



## Four Tests: pH, Phosphorus, Nitrogen, Potassium



### Recommended Nutrient Levels for Seedling Production

Soil Texture	Organic Matter (%)	N (%)	pH	P (kg/ha)	K (kg/ha)
Sandy	1.5	0.07%	5.5 - 7.5	50 - 100	75 - 125
Loamy	2.0	0.10%	5.5 - 7.5	75 - 100	125 - 175
Clay	>3	0.15%	5.5 - 7.5	75 - 125	150 - 250

## Soil Sample:

1. Must be representative of nursery
2. Establish sampling areas
3. In one field, collect from 5 areas and mix all samples
4. Sample at the root zone
5. Keep samples free of foreign objects
6. Keep soil management records



## Soil Preparation:

1. Spread out sample
2. Allow soil sample to dry overnight
3. Remove all twigs, etc.
4. Gently crush soil to remove lumps



## Soil pH: Why It's Important

1. Numerical scale 1 – 14
2. Measures acidity – alkalinity
3. Conifers 5.5 – 6.5 pH
4. Deciduous 6.5 - 8 pH





### **Soil pH Test:**

- 1. Fill test tube (0755) to line 4 with pH Indicator (5701). Squeeze bottle gently.**



### **Soil pH Test:**

- 2. Use .5 g spoon (0698) to add three measures of soil sample to test tube solution.**





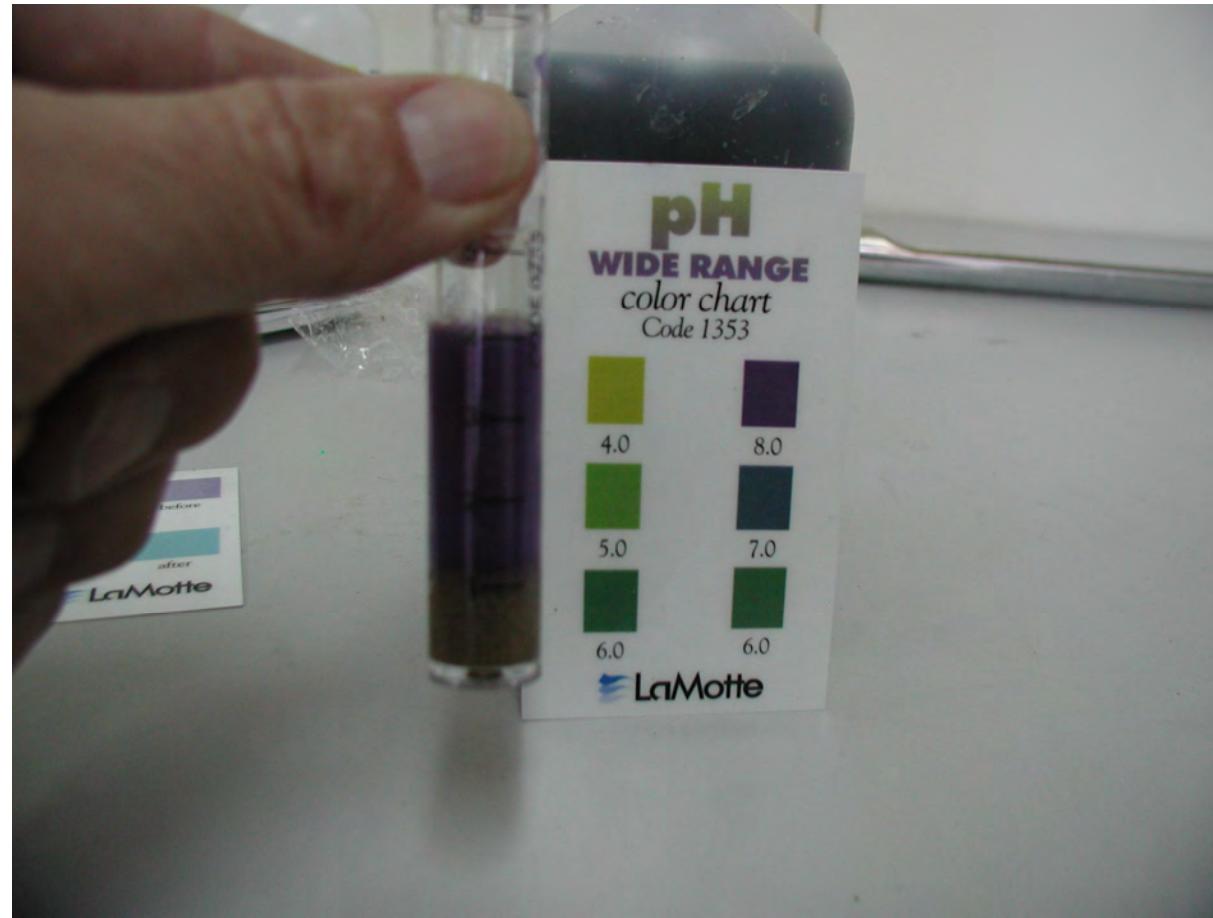
### **Soil pH Test:**

- 3. Cap and mix gently for one minute.**



### **Soil pH Test:**

- 4. Allow test tube to stand for 10 minutes to let soil settle.**



### Soil pH Test:

5. Match color reaction with pH Color Chart



## Phosphorus: Why It's Important

- 1. Vital for root formation**
- 2. Essential for development of cell tissue**
- 3. Vital for development of healthy seeds and fruits**



### **Soil Phosphorus Test:**

- 1. Fill test tube (0755) to line 6 with Phosphorus Extracting Solution (5704)**

### **Soil Phosphorus Test:**

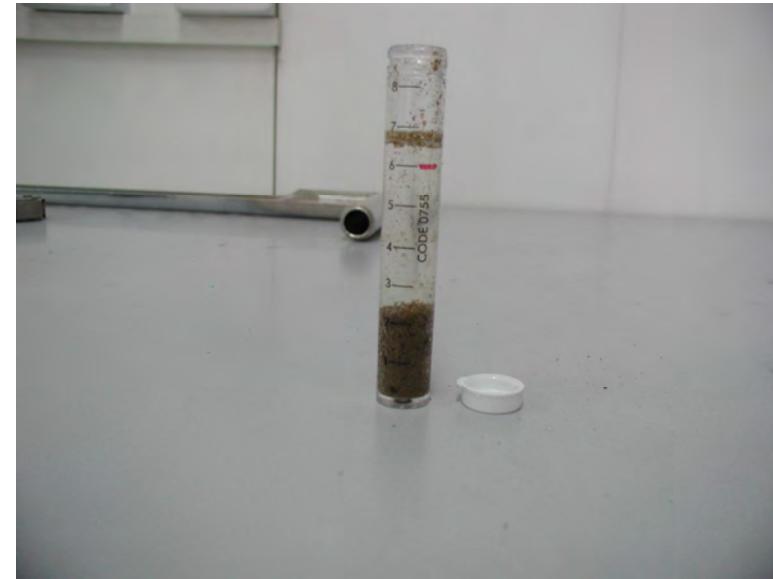
- 2. Use .5 g spoon (0698) to add three measures of soil sample to test tube solution.**





### **Soil Phosphorus Test:**

**3. Cap and mix gently for one minute.**



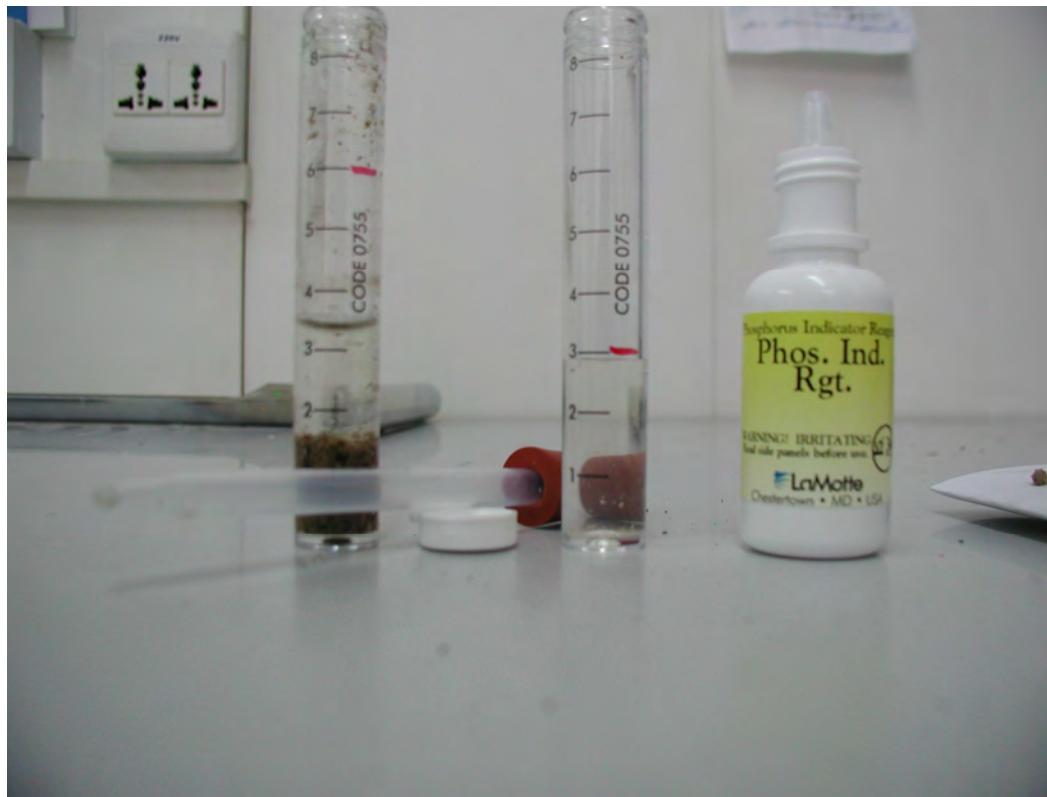
### **Soil Phosphorus Test:**

**4. Remove cap. Allow to stand, and soil to settle, until liquid above the soil is clear.**



### Soil Phosphorus Test:

5. Use one pipet (0364) to transfer the clear liquid to a second clean test tube. To avoid agitation of the soil, squeeze bulb of pipet before inserting into liquid. Release bulb slowly to draw clear liquid into pipet. Do not pull any soil. Fill second tube to line 3.



### Soil Phosphorus Test:

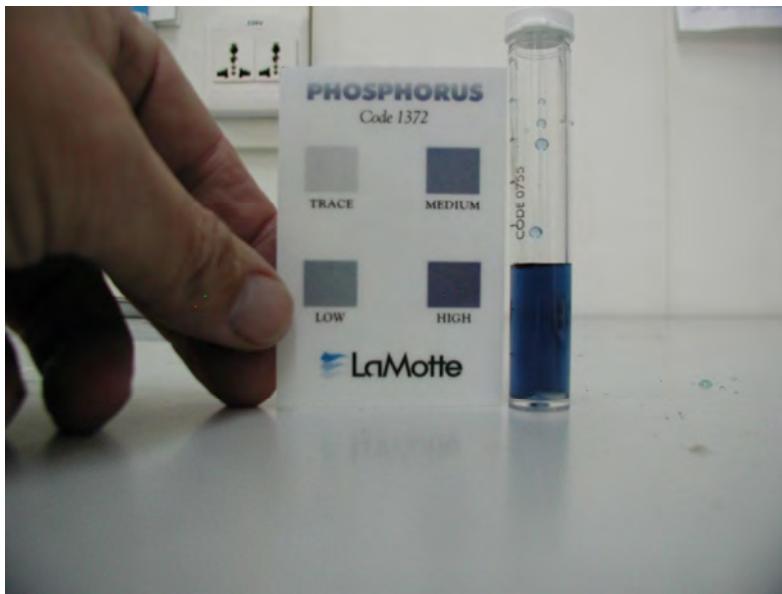
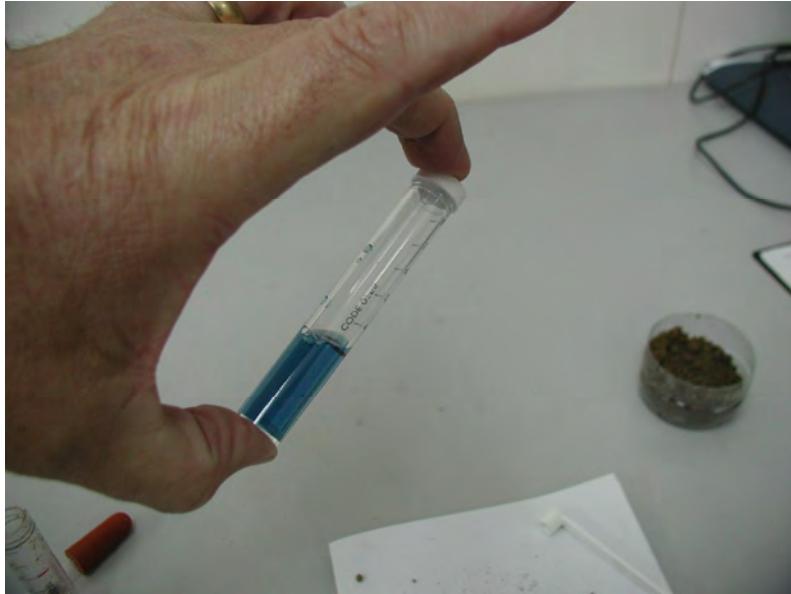
**6. Add six drops of Phosphorus Indicator Reagent (5705) to soil extract in the second tube.**



**Soil Phosphorus Test:**  
**7. Cap and mix thoroughly.**



**Soil Phosphorus Test:**  
**8. Add one Phosphorus Test Tablet (5707).**



### **Soil Phosphorus Test:**

**9. Cap and mix until tablet dissolves. A blue color will develop.**

### **Soil Phosphorus Test:**

**10. Match color with Phosphorus Chart (1372).**

- Low:**      0 – 50 kg/ha
- Medium:**    50 – 100 kg/ha
- High:**       >100 kg/ha



## Nitrogen: Why It's Important

- 1. Part of every living cell (proteins)**
- 2. Directly involved in photosynthesis**
- 3. Stimulates above-ground growth**



## Soil Nitrogen Test:

1. Fill test tube (0755) to line 7 with Nitrogen Extracting Solution (5702)

**Soil Nitrogen Test:**  
**2. Use .5 g spoon (0698) to add two measures of soil samples.**





### **Soil Nitrogen Test:**

- 3. Cap and mix gently for one minute.**



### **Soil Nitrogen Test:**

- 4. Remove Cap and allow soil to settle.**



**Soil Nitrogen Test:**  
**5. Use a clean pipet (0364) to transfer the clear liquid to a second test tube. To avoid agitation of the soil, squeeze bulb of pipet before inserting tip into liquid. Release bulb slowly to draw clear liquid into pipet. Do not pull up any soil. Fill second tube to line 3 with liquid.**



### **Soil Nitrogen Test:**

**7. Cap and gently mix.  
Wait 5 minutes for pink  
color to develop above  
the powder.**





## **Soil Nitrogen Test:**

### **8. Match test color with Nitrogen Color Chart (1371)**

- **Low: 0 – 30 kg/ha**
- **Medium: 30 – 60 kg/ha**
- **High: >60 kg/ha**



## Potassium: Why It's Important

- Promotes photosynthesis and efficient use of water**
- Strengthens natural mechanisms for disease resistance, drought tolerance, transplanting shock**



## **Soil Potassium Test:**

- 1. Fill test tube (0755) to line 7 with Potassium Extraction Solution**



## **Soil Potassium Test:**

- 2. Use .5 g spoon (0698) to add 4 measures of soil sample to test tube.**



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**Soil Potassium Test:**  
**3. Cap and shake vigorously  
for one minute**

**Soil Potassium Test:**  
**4. Remove cap and allow soil  
to settle.**



### **Soil Potassium Test:**

**5. Use a clean pipet (0364) to transfer the clear liquid to a second clean test tube. Be careful not to pull up any soil into pipet. Fill second tube to line 5 with the liquid. Note: If additional extract is needed to fill the tube to line 5, repeat steps 1 through 4.**



### **Soil Potassium Test:**

- 7. Cap and mix until tablet dissolves.  
A purplish color will appear.**



### **Soil Potassium Test:**

- 6. Add one Potassium Indicator Tablet (5708) to soil extract in second tube.**





### **Soil Potassium Test:**

- 8. Add Potassium Test Solution (5709), two drops at a time, keeping count. Mix contents after each addition. Stop adding drops when the color changes from purplish to blue.**

## Soil Potassium Test:

9. Use potassium End Color Chart (1352) as a guide in reading this color change. Keep an accurate count of the number of drops added. Read test results from table.



**4 Drops**

<u>Number of Drops</u>	<u>Potassium Level</u>
0-8	Very high
10	High
12	Medium High
14	Medium
16	Medium Low
18	Low
20 or more	Very low



**8 Drops**



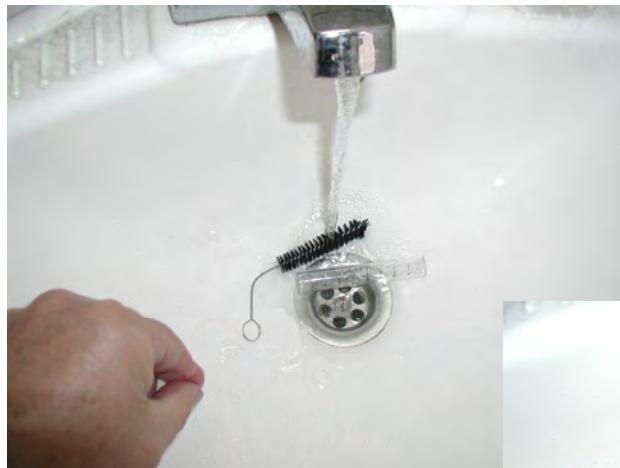
**12 Drops**

- **Low:** 1 – 120 kg/ha
- **Medium:** 120 – 200 kg/ha
- **High:** >200 kg/ha



## Sanitation:

1. Wash all equipment after each use.
2. Dirty equipment could influence results





## Sources of Soil Enrichment:

1. Commercial Fertilizers
2. Organic Fertilizers



<u>Compound</u>	<u>Formula</u>	<u>Nitrogen Content</u>
Ammonium nitrate	(NH4) N03	33.5%
Ammonium sulfate	(NH4)2 SO4	21%
Diammonium phosphate	(NH4)2 HPO4	21%
Anhydrous ammonium	Liquid NH3	82%
Urea	CO (NH2)2	45%
Calcium Nitrate	Ca (NO3)2	15%
Mixed fertilizers, as	10-10-10	10%