

## **Beginner's Column**

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### **pH, Rx for Healthy Plants**

As African violet growers, we are keenly aware of the necessity of supplying nutrients to our plants by fertilizing. But, how many of us are aware that just as important to an African violet's nutrition is the pH of the soil it is growing in?

Most people (myself included in my early days of violet growing) think of pH as being something beyond understanding, mysterious, and best left alone. However, we should consider pH as a tool to grow better and healthier African violets. In actuality, pH is just as important to our violets as adequate light, water, and fertilizer.

The symbol pH refers to the degree of acidity or alkalinity of the soil (or soil mixture). The pH scale is divided into units from 1 to 14, with its midpoint being 7. Think of the scale in relation to a thermometer: just as a thermometer measures temperature with 32 degrees Fahrenheit (or 0 degrees Centigrade) as a reference point, the pH scale measures acidity and alkalinity using the value 7 as a reference point. The value 7, or pH 7, is called neutral. This means that the soil at pH 7 may contain substances that are acidic and alkaline, but that they are in even balance. A pH reading greater than 7, such as 9, means that the soil is alkaline; while a pH reading less than 7, such as 5, indicates that the soil is acidic.

The pH scale isn't like the uniform marks on a thermometer, however. Each unit is ten times greater than the previous unit, as you progress each way from pH 7. Thus pH 6 is ten times more acid than pH 7, pH 5 is 100 times more acid, and pH 4 is 1000 times more acid than pH 7. In the other direction, pH 8 is ten times more alkaline than pH 7 and pH 9 is 100 times more alkaline than pH 7.

You may ask, "Why bother with all this stuff about pH?" The answer is quite simple. Unless the soil your African violets are growing in is at the correct pH level for them, your violets cannot absorb some nutrients from the soil even if the nutrients are contained in the fertilizer you give the plants.

All the essential nutrient elements in your soil are readily available to the plants only when the pH is in the range of 6.4 to 6.9. Also, the beneficial soil bacteria are more productive in releasing the plant nutrients from the soil in adequate quantities when the pH is 6.4 to 6.9. If your soil pH is outside the pH range of 6.4 to 6.9, your plant nutrients may become "locked up" and not available to your plants. Phosphate, for example, in the soil, is one of the most insoluble elements that African violets need. Phosphate insures good root growth, gives a constant push to bloom production, promotes sturdy plant development and strong stems, and brings out the redness in leaves. Phosphate is most soluble when the pH is slightly acid (pH 6.2 to 6.5). In most soils, phosphate is fixed to soil particles and unavailable for plants to utilize when the pH falls between 5 and 6 or when the pH rises above 7.5. If the soil remains outside those limits, your African violets can become starved for lack of available (soluble) phosphate – a condition called "phosphate lock up."

To correct "phosphate lock up" and make the phosphate again available to the plant, soak the soil with a lime-water solution (one tablespoon of dolomite lime to one gallon of warm water) several times in place

of your regular watering. Use this procedure only if your soil is acidic (below 6.4 on the pH scale). If your soil is alkaline (above 7 on the pH scale) soak the soil with a solution of vinegar water (two tablespoons of white vinegar to one gallon of warm water) several times in place of your regular watering – or you can sprinkle finely ground sulfur on the soil (one teaspoon of sulfur to a 4" pot) and water in well with warm water (several times in place of your regular watering).

If dolomite lime is unavailable, and your soil is too acid (below 6.4 on the pH scale), you may use a solution of one-half teaspoon of Epsom salts and one-half teaspoon of whiting to one gallon of warm water to correct the acidity.

A fairly reliable sign that your plants are suffering from "phosphate lock up" is a yellow edging around the sides of the African violet leaves. If you can rule out too much light, another fairly reliable indication that the soil your violets are growing in is too acidic are "tight centers" in the plants, with new developing leaves being very turgid or rigid and tightly curled. Signs that may indicate the soil is too alkaline include pale or bleached leaves, leaves with brown edges, and retarded or slow growth of the plants.

Rather than guessing if your soil is at the proper pH range, it is best to test the soil periodically. Using a kit designed for that purpose, such as the inexpensive Sudbury Soil Tester available from most garden stores, testing the soil pH is a simple matter. Follow the directions in the kit. This involves filling a test tube ¼ full with dry soil and then adding an indicator solution until the test tube is ½ full. Then the test tube is corked, and you shake the tube vigorously. Allow the soil to settle in the test tube, and then compare the color of the solution with the color chart provided with the kit, to get a pH reading.

As a preventative measure, to minimize the acid buildup in your soil from repeated applications of fertilizer and the natural tendency of peat moss (which makes up a large percentage of most African violet soil mixtures) to maintain the soil mixture on the acid side of the pH scale, I recommend the use of the lime-water solution or the Epsom salts/whiting solution once each month in place of your regular watering, and repotting into fresh soil (within the pH range of 6.4 to 6.9) at least every four to six months.

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