



BARTLETT TREE

RESEARCH LABORATORIES

CHARLOTTE, NC

Plant Health Care Program



Hydrangea Culture and Care

Hydrangea are one of the showiest and most spectacular flowering woody plants in the landscape, and are commonly grown successfully in climates ranging from zone 4 through zone 8. This plant also has the added feature of being one of very few flowers that can be manipulated culturally to produce different color blooms. The following information regarding culture, bloom color, and pruning needs applies only to the most common species of Hydrangea, *Hydrangea macrophylla*, commonly referred to as the garden, French, common, or bigleaf hydrangea. **Other common species such as the oak-leaf or PeeGee hydrangeas have different growth habits and cultural requirements.**

Growing conditions-

Hydrangea plants grow best in well drained soil that is high in organic matter. The plant requires a good deal of moisture; however, it is subject to root rots and other problems if the soil stays saturated for extended periods. Hydrangea will thrive in full-sun when it is well established, but can also do well in partial shade. Fully shaded plants may not bloom as prolifically and are more affected by leaf spot and powdery mildew fungi. Nitrogen fertilizers will encourage vegetative growth of this plant, but excess nitrogen can actually inhibit blooms. Hydrangeas generally prefer slightly acidic soils in the pH range of 4.5-6.5, and manipulation of the soil pH is one key factor in controlling bloom color. This aspect will be discussed further below. Soil analyses must be performed to determine the specific needs of each soil.

Pruning-

Hydrangea is a plant that produces blooms on one year old growth, and this must be kept in mind when pruning the plants. The best time to prune is just after blooms fade in mid-July to August, depending on your location. This allows the plant to produce some new vegetative growth before winter dormancy, and it will be on this growth that flower buds are produced. Pruning too late in the season will cause the new vegetative growth to be susceptible to winter injury, and waiting until the spring to prune will remove the flower buds that were produced on last year's growth. On older plants, about one third of the oldest woody stems should be pruned to ground level in order to encourage the growth of new vegetative sprouts which will bloom more prolifically than woody growth. 'Dead-heading' or removing faded flowers will promote production of foliage.

Flower color-

The color of big-leaf hydrangea flowers is dependent on a variety of chemical factors, and can range from blue to pink, with the possibility of all shades in between. There are white varieties of *H. macrophylla*, but changing the color of white varieties is not possible.

The true cause of color variation in hydrangea blooms is the amount of aluminum found in the flower tissue. This element binds with certain pigment complexes, causing them to appear blue in the presence of aluminum, and pink in its absence. Changing bloom color is not as simple as adding aluminum to the soil, because the plants ability to take up aluminum is largely dependent upon the soil pH, and to a lesser extent dependent upon the presence of phosphorous.

Blue flowers- Hydrangea blooms will be blue under most natural conditions due to the fact that most soils have some aluminum present, and have the appropriate pH for uptake of that element. The ideal pH for blue flowers is in the range of 4.5 to about 5.5 because this is the ideal range for aluminum uptake. The presence of phosphorous can bind aluminum making it unavailable for uptake, and therefore prevent blue color even when ample aluminum is present in the soil. This should be a consideration when choosing fertilizer formulations. If a soil test shows that pH is in the correct range but aluminum is lacking, it can be added to the soil in the form of dissolved aluminum sulfate. This will add aluminum and acidify the soil, but care must be taken because aluminum can become toxic at high levels. Also, direct contact of this solution with foliage will cause burn.



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Pink flowers- In order to produce pink blooms on hydrangea, it is necessary to inhibit the uptake of aluminum. This can be achieved by raising pH to levels where uptake is inhibited, normally in the range of 5.7-6.2. Exact pH levels will vary and intermediate colors will result from pH levels in the middle of these ranges. Soil pH can be raised using lime, but care must again be taken to avoid direct contact with foliage. Raising the pH too high will lead to iron deficiency because uptake of this element is reduced under basic conditions.



Exact rates of aluminum sulfate or hydrated lime will vary depending on existing pH, aluminum levels, and the buffering capacity of the soil. **The only way to determine the pH, aluminum level, and nutrient needs of a soil is to submit a sample for a laboratory analysis. Soil nutrient analyses must be conducted before soil amendment takes place.**

Disease and Insect Concerns-

The main disease concerns of hydrangea are fungal leaf spots that will develop if the foliage remains moist for extended periods, especially overnight when the temperature cools down. Common foliar diseases include Botrytis blight (*Botrytis cinerea*), Cercospora leaf spot (*Cercospora* spp.), and powdery mildew (*Erysiphe polygoni*). All of these diseases can be reduced through cultural methods and controlled with various chemical options. Hydrangea is also susceptible to root rot caused by a fungus-like organism, *Phytophthora nicotianae*. This is most common in container grown plants and is only a problem in the landscape on over-watered and poorly drained sites.

The main insect pests of hydrangea are sucking insects that cause yellowing and distortion of developing leaves. These include aphids, mites, scales, and plant bugs. Most insect problems are minimal if the plants are monitored periodically and control measures are taken soon after the pest first appears.