



William T. Kemper Center for Home Gardening

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Rhododendrons and Azaleas

Rhododendrons and azaleas are among the most important of garden plants. The majority of naturally occurring species are native to the areas in southeastern Asia from the northwestern Himalayas, Tibet and western and central China extending south and east to Malaysia and the Philippines. Members of the genus *Rhododendron*, whose species and hybrids we know as azaleas and rhododendrons, belong to an old group of plants in the family Ericaceae. Fossil records show that rhododendrons have been around for at least 50 million years and have changed very little in flower form and habit. Presently, we recognize about 1,000 combined terrestrial and epiphytic species. These vary from tiny mat-like plants to large trees growing in excess of 60 feet.

The beginning of rhododendron cultivation dates back to the 1600s. Many of the garden hybrids were products of breeding North American species and their hardiness is well represented in the garden rhododendron we have available today. Taxonomically, all azaleas and rhododendrons are classified as belonging to the genus, *Rhododendron*; this is a point of confusion for many people. The name azalea is commonly used to distinguish those plants which lose their leaves at the end of the season (deciduous) and have funnel-shaped flowers with 5 stamens. Rhododendrons, on the other hand, are considered to be larger, evergreen, shrub-type plants with bell-shaped flowers and ten or more stamens. There are exceptions to these rules, for instance many garden azaleas retain their leaves all year long, depending upon where the plant is being grown and the climate conditions.

Rhododendron culture is fairly simple if certain conditions are met and varieties are hardy. They are mostly woodland and alpine plants and do best if grown under humid, cool conditions. They require acid soils and protection from the cold and wind. Azaleas tolerate more exposure to the sun and, therefore, drier conditions than rhododendrons and therefore, are easier for the average gardener to grow.

Landscaping

Of all cultivated plants for landscaping home and garden areas, rhododendrons and azaleas have some features and advantages offered by no other plant materials. First, few other evergreen shrubs produce such a spectacular floral display in March and April. In addition, there are relatively few choices of medium-sized, shrub-type, broadleaved evergreens. The broadleaf evergreen form is highly desirable for year-round cover of unsightly areas or to keep some winter interest in the landscape when mixed with deciduous plants. Often rhododendrons and azaleas are planted near foundations, steps and decks to soften architectural features.

There versatility beyond being used around sidewalks, fences, buildings and walks extends to other parts of the landscape. In a full sun location, they may be used as background to contrast against smaller, mounding, mid to late-season flowering perennials including lily turf, dwarf hibiscus, butterfly weed and balloon flower. If planted in a shady spot, they can be combined with hosta, astilbe and bergenia to make a

colorful display tolerant of low light conditions. Other interesting combinations for early spring display include mixing with pink and white dogwoods accompanied by side plantings of tulips, daffodils and grape hyacinth. You also might consider a mixed planting with blueberries which favor acid soils and can provide interesting fall color.

Planting Location

The Missouri climate is not the most ideal for growing rhododendrons and azaleas because of the hot summers and potentially cold winters. This means that special consideration should be given to the growing location in the landscape. Good success is more likely when these plants are grown in protected areas away from prevailing southwest winds and direct afternoon sun. Wind protection can be enhanced by planting strategically next to structures or locating plants among groups of evergreen plantings.

The best site would be on the east or north side of the home where morning sun is good and the hot afternoon sun is screened out. Here, the root system will receive some protection from high soil temperatures. Growing plants on slopes is preferred because the root system is adversely affected by water-logged soils and drainage improves on a sloping hill. Rhododendrons and azaleas do not fare well in shade, as wrongly believed by many gardeners. Filtered sunlight is preferred. Exposure to winter sun can also be a problem for evergreens and may cause the leaves to dry out because of their inability to move water from cold or frozen soils.

Planting Bed Preparation

Selecting the proper growing site is only part of the formula for successfully growing rhododendrons and azaleas. They also require special site and soil preparation.

Choose a well-drained site

Most soils in our landscapes are heavy and full of clay. Root systems of these plants are unable to penetrate heavy soils and are fairly sensitive to changes in temperature and soil moisture. Good drainage is critical and the planting bed must be prepared to rid excess water. One way to test the drainage is to dig the planting hole out and fill it with water. If the water does not drain out within a few hours, then the planting hole should be enlarged to twice the size of the root ball and amended with compost, sand or expanded clay. As an alternative, consider planting on top of the ground in a raised bed with well drained, amended soil. This is a popular method, since it reduces any doubt whether the rooting zone will be well drained. However, as the soil settles, soil or compost should be added to prevent the root system from becoming exposed.

Correct for Acidity

Rhododendrons and azaleas are acid loving plants meaning that the soil needs to be slightly acidic to optimize growing conditions. The pH of the soil is a measure of the soil acidity/alkalinity and is best evaluated by submitting at least two cups of soil taken from the planting site to a soil testing laboratory before planting. The most desirable pH for growing rhododendrons and azaleas is in the range of 5.0 to 5.5. Native soils are typically acidic, but not enough for these plants. You may need to increase the acidity of the soil by amending with sulfur or iron sulfate.

Lower the Soil pH to 5.5

Soil pH * (initial)	Pounds of Sulfur per 100 sq. ft.	Pounds of Iron Sulfate per 100 sq. ft.
8	5.5	13.5
7.5	5	11.5
7	3.5	9
6.5	1.5	3.5

* the initial pH is based upon a soil test. Some differences in final pH will occur with soil type. Clay soils require heavier applications.

Preparing the Soil

The planting hole should be dug out several weeks in advance of purchasing the plants. This will give some time for the soil to be prepared, amended and allow for some settling of the mixed soil.

Rhododendrons and azaleas will thrive in soils heavily amended with organic matter including compost and peat moss. In heavy clay soils, spend extra time to mix plenty of organic matter with the native soil. Avoid using compost which has not broken down to a dark-colored, medium-graded material. Mixing the soil with coarse leaf mold will only mean that the soil mix and plant will settle too deeply into the hole as the leaf mold breaks down. This may lead to subsequent water collection at the bottom of the hole and a root rot condition.

The soil mix should consist of about 50 percent organic matter, 25 percent native soil and 25 percent sand or expanded clay. The latter ingredients will promote better soil drainage. When mixing, add the sulfur to lower the pH according to the soil test results.

Planting

Rhododendrons and azaleas are typically purchased as either container or as balled-and-burlapped plants. For container plants, tap the soil ball out of the container and gently tease the soil ball apart exposing some of the roots. Do not completely disrupt the soil ball and avoid pulling the roots out. Balled-and-burlapped root balls can be planted intact. However, remove any twine used to hold the ball together and tied to the main stem.

There are two different methods of planting in-ground and raised beds. But before you begin to dig the hole, plan to space the plants about 3 to 4 feet apart. This will allow room for growth over time and some space to get in and around the plants for maintenance. Also understand that these plants have shallow root systems and do not respond well if the root system is buried deep.

In-ground Planting

The diameter of the planting hole should be dug to about one foot larger than the diameter of the soil ball. However, the wider the hole, the better chances of success. This is because these plants are shallow rooted and develop root systems which grown more laterally than deep. The planting hole should be no deeper than necessary to position the plant so that the soil ball is about 2 inches higher than the surrounding soil (to allow for settling). The only time you may need to dig the hole deeper is if there is poor sub-surface drainage. Loosening the soil in the bottom of the hole should correct this and is more important when planting on a flat grade where water can collect.

Raised Beds

Because planting in heavy clay soil can be a real problem for growing rhododendrons and azaleas and considerable effort will go into improving these soils, planting on top of the soil surface in a raised bed is a good alternative method. In raised beds, the soil mix is controlled from the beginning ensuring the right composition of ingredients. Also, soil drainage is typically better in raised beds. To make a raised bed, simply position the root ball on top of the native soil surface and fill in around the plants with a soil mix as describe above. Overtime, the soil will settle. When this happens, additional materials should be applied. Keep close watch that the root system does not become exposed.

Until the plants have formed a good root system extending into the amended soil, they will be unstable and might shift. Plan to stake the plants in areas where wind is a problem or there is considerable foot traffic. Do not put a raised bed in a low area where water collects. Make sure that all water flows away from the bed.

Mulching

Keeping the root ball high in the planting site means that plenty of mulch should be used to cover the root system above the soil surface, especially during the initial period of establishment. To do this, mulch around the plant with about 4 to 6 inches of leaf mold. Oak, maple leaves and pine needles are acidic materials which will help keep the soil acid if used before they are completely decomposed. Otherwise, just use half-composted leaf mold or wood chips of any source. Maintain this mulch throughout the season to cover and protect the crown against effects of freezing/thawing.

Plant Maintenance

Once planted, you will need to water, fertilize, monitor the soil acidity, prune when required, provide for winter protection and control insects and diseases.

Watering

While watering seems to be a straight forward gardening practice, there are some special considerations regarding rhododendrons and azaleas. The most frequent cause of problems with these plants has to do with the supply of water. Since they are shallow-rooted, they require a steady supply of water in face of the extremes in moisture evaporation of the upper 3 to 4 inches of soil during summer. Especially during the first 2 to 3 years of establishment after planting, follow a regular watering schedule of 1 inch per week through the summer. For well-drained beds, this should be sufficient.

On the other hand, overwatering is the leading cause of difficulties notably in sites which are not well drained. Frequently, gardeners complain of leaves drooping and wilting in spite of apparent adequate water supply. In poorly drained sites, when the root system becomes waterlogged, leaves will fold up and droop downward as if they were dry. This fools a person into watering, which further aggravates the problem. Root systems sitting in water become devoid of oxygen and fail to take water up, leading to a water deficit. If this condition prevails, it can lead to root rot and overall decline. The remedy is to start with a well-drained site and if these symptoms occur, dig down into the soil to check whether excess water has collected as evidenced by the heavy smells of decaying organic matter. To correct this, you must channel water away from the site or spend considerable time poking drainage holes deep into the soil where water can flow.

For rhododendrons and evergreen azaleas, it is best to begin withholding water about early-October so that plants will start to harden off in preparation for winter and colder temperatures. If the fall has been

excessively dry, it is helpful to water after the first killing frost to make sure that some water is available for plant uptake. During cold, sunny and windy times, the root system will need to replace water evaporating from the evergreen leaves. Fall watering can begin about mid-November.

Fertilization

Rhododendrons and azaleas do not require much fertilizer. Over-fertilization can be a problem especially if it is done at the wrong time. Water-soluble fertilizers should be applied in May after flowering. Slow-release fertilizers including organic forms can be applied earlier. Plants should not be fertilized after July. There are specially formulated fertilizers for rhododendrons and azaleas which ensure an acid reaction in contact with soil. Commonly used fertilizers include Miracid, ammonium sulfate and ammonium nitrate, all of which supply nitrogen. These should be applied at the rate of 1 pound of nitrogen per 100 square feet of bed space.

Soil Acidity

Every 2-3 years, a soil test should be done to check that the soil acidity is in the range of 5.0 to 5.5. Applications of sulfur or iron sulfate may be necessary, but amounts should be carefully monitored. Over-application of sulfur may lead to burning of the leaves. Symptoms will appear as dieback of the leaf tips within several weeks after application. Apply only about one-half pound of sulfur per 100 square feet at any one time to avoid burning. Wait 6 weeks before applying more if required.

Pruning

Generally, rhododendrons and azaleas do not need much pruning except to correct form, maintain good flowering from season to season and remove diseased portions. Prune only after flowering has ceased. Deadhead by removing spent blossoms and flower stems with a clean hand pruner. Do not remove more than necessary otherwise you will affect next years flower set. More severe shaping can be done, but do so by gradually removing ends back to the next set of whorled leaves. It is not necessary to apply wound dressings. Pruning after July should only be done to remove diseased and broken branches.

Winterization

It is common to find some damage occurring due to cold and wind on evergreen rhododendrons and azaleas. Selecting a protected site for planting is the best defense against this, although it is not always a guarantee. The most common symptom of cold exposure is rolled up leaves that droop downward. This is quite normal and should be expected during winter. Plants should recover nicely in the spring.

The biggest problem comes when plants are exposed simultaneously to bright sunshine and winds. For evergreen varieties, sun and wind will cause water loss from the leaves and stems. Cold soils retards moisture uptake by the roots. The only practical way to prevent this from having a real impact upon the plant is to protect it from sun and wind. Barricades of evergreen branches, burlap screens, snow fence or other materials can be constructed to provide some protection. Piling leaves around the plants about the base will help insulate the root system. Plants should not be entirely covered or rodents may eat the bark from the branches and cause some dieback.

Problems and Diagnosis

Scorch and Leaf Curl

It is not unusual to find evergreen rhododendron leaves cupping and drooping in mid-summer and winter. This is a typical response to water stress in summer when the weather becomes very hot and plants are exposed to full sun. If sufficient water is not available, the leaves may begin to show some browning in the center of the leaf or at the edges. Repeated injury will reduce growth over time and may be a sign that you should relocate the plant to a cooler site and/or examine the soil for its ability to retain moisture. Improving the soil by incorporating organic matter and mulching should help. In winter, cupping/curling is due to cold temperatures and an inability to move water to the leaves from cold or frozen soils. Fall watering will help this condition by making water available for uptake. Mulching, protection from drying winds and direct winter sun should be considered to avoid or reduce injury.

Iron Chlorosis

Yellowing or chlorosis of leaves is a general symptom and response to poor growing conditions; excess water, soil compaction, calcareous soils, nutrient deficiency or high soil pH. The most common problem is a high pH, which causes a nutrient imbalance. When the pH of the soil is too high, some nutrients, including iron and manganese, become locked up in the soil and are unavailable for uptake by the plant. Their deficiency leads to leaf yellowing. To diagnose this disorder, check the soil pH. If the soil pH is above 6.5, add sulfur or iron sulfate according to soil test results. Alternatively, you can make a spray application of iron sulfate to the leaves at the rate of one ounce per gallon of water. If iron is deficient in the plant, it should begin to green up in about one week. A manganese deficiency may be diagnosed the same way. Applications of manganese sulfate should be applied with caution because of its toxicity to leaves.

Cold Injury Dieback

In general, low temperatures can kill plants or cause various degrees of injury. Where freezing temperatures arrive early before the plants have sufficiently hardened off, even the most hardy rhododendrons and azaleas can be injured by the cold. The most common cold weather injury is loss of the flowers. While the external appearance of the flower buds is normal, cold temperatures will kill the immature tissues buried within the buds. Cutting the buds open will show a darkening of this tissue damaged by the cold. Low temperatures will also cause leaf scorch, leaf kill and stem dieback. When plants have not hardened off properly, cold temperatures may cause the bark to split. A sudden drop in temperature in the early spring after a mild winter is the most typical. Later on in the season, the plant will wilt and die back. Prevent cold injury by selecting hardy varieties, providing afternoon or partial shade, ensuring good soil drainage, fertilizing no later than July, fall watering when dry, protecting plants from drying winds and mulching.

Phytophthora Root Rot

The most important infectious disease of rhododendrons and azaleas is caused by the fungus *Phytophthora* spp. This disease generally gets started in propagation nurseries and is moved to the landscape with the purchase of infected plants, particularly container material. This disease affects leaves, stems and roots causing leaf spots and blights, dieback of branches and death of mature plants. Generally, the disease is not noticed until some branch dieback has occurred as a result of stem or root infection. When the root system has become infected, the whole plant may die in a month to a year depending upon the age of the plant and its condition. Young plants are more susceptible because they have not become well established and are subject to stress due to changing weather. Older plants are better able to outgrow the infection once it has occurred.

Once the disease has become established, control is difficult. The following are some suggestions for root rot control.

1. Purchase disease-free plants: inspect plants for leaf spots and blights, stem cankers and dead branches.
2. Avoid overhead irrigation: this and frequent rainfall favor rapid disease development.
3. Avoid excessive nitrogen applications: this promotes flushes of growth and rapid disease development.
4. Purchase resistant cultivars: most are susceptible, however, PJM and 'Roseum Elegans' are more resistant
5. Remove dead branches: using clean pruners, cut away dead branches well into healthy tissue.
6. Fungicides: when diagnosed, several fungicides can be used to retard disease spread, however, none will completely rid the disease. Subdue, Fosetyl Al, Truban and Banrot, are best used as preventative fungicide treatments.

Black Vine Weevil

This insect feeds at night on leaves and produces C-shaped marks at the margins of leaves. Imported from Europe over 100 years ago, this insect is now distributed in the eastern U.S., north central, mid-Atlantic and Pacific Coastal areas, but cannot apparently survive well in the south. Weevil larvae will feed on the roots in the early summer and adults emerge in June and July to feed on the leaves. Rarely is damage severe however, if root feeding continues, some branch dieback may occur.

Varieties

Of the recognized species of evergreen, semi-evergreen or deciduous rhododendrons and azaleas, 30 are native to North America. *Rhododendron prinophyllum* is native to Missouri. Named mountain azalea, this small, deciduous, but quite fragrant shrub is found in only 15 counties in southeast Missouri. Its distribution, however, extends northward into Quebec which suggests that it is quite cold hardy.

Every year new hybrids are being produced and registered through the American Rhododendron Society often times under group names like Ghent, Exbury, Glenn Dale and Gable. Many of these are progeny of tropical/semi-tropical and temperate parents so considerable variation in cold and heat hardiness is found.

Making choices of which rhododendron or azalea to plant is not easy. The first consideration should be with respect to their relative hardiness. The hardiest and easiest to grow is the deciduous azalea. Evergreen rhododendrons and azaleas are typically not as hardy, but some fairly reliable hybrids have been grown in the St. Louis area.

Rhododendrons *

'Album Elegans'
'Bosley Dexter 1009'
'Catawbiense Album'**
'Great Eastern'
'Ken Janek'
'Maximum'
'Olga'

'Apple Blossom'
'Boule de Neige'
'Conewago Improved'
'Ice Cube'
'Lodestar'
'Nassua Red'
'Parsons Gloriosum'

'Blue Ensign'
'Dexters Pink'
'Francesca'
'Janet Blair'
'Nova Zembla**
'Oritani'
'P.J.M.'**

'Purpureum Elegans'
'Scintillation'
'Wyanokie'

'Roseum Elegans'**
'Showme Lake'
R. yakusimanum hybrids

'Russel Harmon'
'Windbeam'

* list provided by Ed Wood, St. Louis, MO

* very hardy and excellent for beginning gardeners