

*Azaleas offer  
endless challenges*

# AZALEAS

*Revised and Enlarged Edition*

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#### 4. AZALEAS—PLANTS, HABITS, FLOWERS, AND LEAVES

Azaleas are generally described as shrubs, although some of the deciduous species become small trees in the wild. It is not uncommon, for example, to find in established gardens in the southeastern U.S., such as Callaway Gardens, North American native azaleas 15 to 20 feet tall. Wild plants of the Piedmont area of Georgia, U.S.A., are often over 25 feet in height. Many of the deciduous azaleas of Japan have been observed as small trees. In the Nikko Chanokidaira Botanical Garden native plants of *R. quinquefolium* are small trees with trunks over 12 inches in diameter.

The evergreen azaleas include both upright and spreading shrubs, some less than two feet, others up to ten feet or more. The Kurume Azaleas generally have the reputation of being low growing and dwarf shrubs, but many cultivars today are eight to ten feet in height and still growing. Again, at Callaway Gardens, several Kurume Azaleas are 15 feet tall.

Evergreen azaleas are usually densely branched and twiggy, but the Kaempfer Azalea, *R. kaempferi*, tends to send up tall shoots which are filled out with age. At Planting Fields in New York, U.S.A., several Kaempfer Azaleas are at least 15 feet in height. Large massive Southern U.S. azaleas such as 'Formosa' are 12 to 15 feet across and equally as high.

Deciduous azaleas are usually more open or loosely branched, some having ascending and others, horizontal branches. The Royal Azalea *R. schlippenbachii* and the Pontic Azalea *R. luteum* are densely branched.

Among the azaleas one can select plants of nearly every habit or growth. The selections of *R. nakaharai* such as 'Mount Seven Star' and the North Tisbury hybrids are often only 12 to 18 inches in height after ten years and two to three times as wide. Weeping forms such as 'Flame Creeper' and 'Pink Cascade' are now available for hanging baskets and trailing over walls. Some azaleas like the Satsuki, Beltsville dwarfs and selections of the Greenwood hybrids, after 15 years, are less than 24 inches high and twice as wide. A 20 year old plant of

'Salmon Elf' at Callaway is approximately 30 inches tall and 50 inches wide. A 200-year-old plant of *R. scabrum* near Kurume, Japan, is over 15 ft. wide and 10 ft. high, with a trunk diameter of over 15 in.

A century-old plant of the Ghent hybrid 'Unique', at the Sunningdale Nursery in England, is over 16 ft. high and 30 ft. wide. The more spreading types such as 'Indica Alba' 'Mucronatum' will often be twice as broad as high. Old plants of this cultivar can be seen at Morris Arboretum in Philadelphia, U.S.A., over 25 ft. wide, possibly from repeated self-layering. Large wild colonies of individual plants of *R. atlanticum* in the sandy coastal regions of Virginia and New Jersey, U.S.A., may cover several thousand square feet. The size of an azalea after 10 years may vary considerably due to climatic regions. A Kurume Azalea in 10 years may be 4–5 ft. tall in the Southeastern states of North America, only 3–4 ft. in Washington, D.C., and smaller in areas north and the mid-West. In London, England, the plants are 3–4 ft.; in the colder regions of Europe they are even smaller. In contrast, they are taller in Australia and New Zealand.

Azaleas are not fast growers, and the very dwarf azaleas are really slow. Average growth of three to ten inches is common. However, by forcing with a regular fertilizer program, moisture and pinching, the rate of growth can be increased.

## FLOWERS

The fascination of azaleas is a direct outgrowth of the wide variation in form, color, and size of the flowers. Understanding the structure of an azalea flower is a prerequisite to identifying the many species and cultivations.

**Corolla.** The typical azalea flower has five petals or lobes and is sympetalous or joined at the base from which the petals flare out. Collectively the petals form the funnel-shaped corolla, in the form of a tube, as lower portions fuse. The limbs or petals, the upper separate portion, may be overlapping, imbricated, or flaring.

The five petals are arranged in a symmetrical or butterfly fashion. Facing the flower, one petal, the standard or dorsal lobe is at the top. Two petals, the upper wings, are below the standard and on either side. Usually they constitute the greatest width of the flower. The two remaining petals, the lower wings, are lower and usually closer together, but can be spread out and are equal to or wider than the upper wings.

**Calyx.** The calyx surrounds the corolla at its base and is composed of five small green sepals that are partly fused at the base. The sepals are minute, ranging in length from 1/24 to 1/8 of an inch or longer. Occasionally, as in the Big Sepal Azalea *R. macrosepalum*, the sepals may be over an inch long and a prominent feature. On double and hose-in-hose flowers, the sepals become petaloid so are usually visible as a separate flower part.

**Perianth.** A collective term for the corolla and calyx.

**PediceL.** A short, slender green stalk, called the pedicel, supports the flower and is attached to the branch. Depending on the species, the pedicel may be up to 3/4 of an inch long, very short or sessile, meaning not stalked, or virtually absent. The flower is then sessile, meaning not stalked.

**Pistil.** The female portion of the flower or gynoecium is composed of the ovary, style, and stigma. The ovary is in the center and just above the base of the corolla. The ovary is the seed bearing part of the flower and consists of five cells or locules. The style is a hollow tube originating at the ovary and terminating in a small, rounded appendage called the stigma. The stigma when ripe is sticky on the surface to receive and retain the pollen.

**Stamens.** The stamens, or male organ of the flower, are composed of filaments supporting pollen-bearing anthers, and arise at the junction of the ovary and corolla. The stamens usually occur in multiples of five and are often of unequal length. In many of the deciduous

azaleas, the stamens are exerted, extending beyond the corolla, and are a conspicuous, attractive part of the flower. The anthers, pollen-bearing parts of the stamens, are at the top of the filament and are divided into two sacs. The pollen grains are borne in tetrads and come out of apical pores at the end of the anthers. All the pollen comes out together in a stringy matrix. The shedding of pollen from apical pores by azaleas differs from most genera which discharge pollen by longitudinal splitting of the anthers.

**Seed Production.** The ovary after fertilization by pollen, develops into a five-parted seed capsule which may be only  $\frac{1}{4}$  of an inch long in *R. serpyllifolium* or up to one and a half inches long in *R. japonicum*. The seeds are generally small and numerous and may be winged or nonwinged. The evergreen azaleas have nonwinged seed. The North American deciduous species all have winged seed except *R. arborescens* and *R. vaseyi*. The Asiatic deciduous species all have nonwinged seed except *R. japonicum*, *R. molle*, and *R. luteum*.

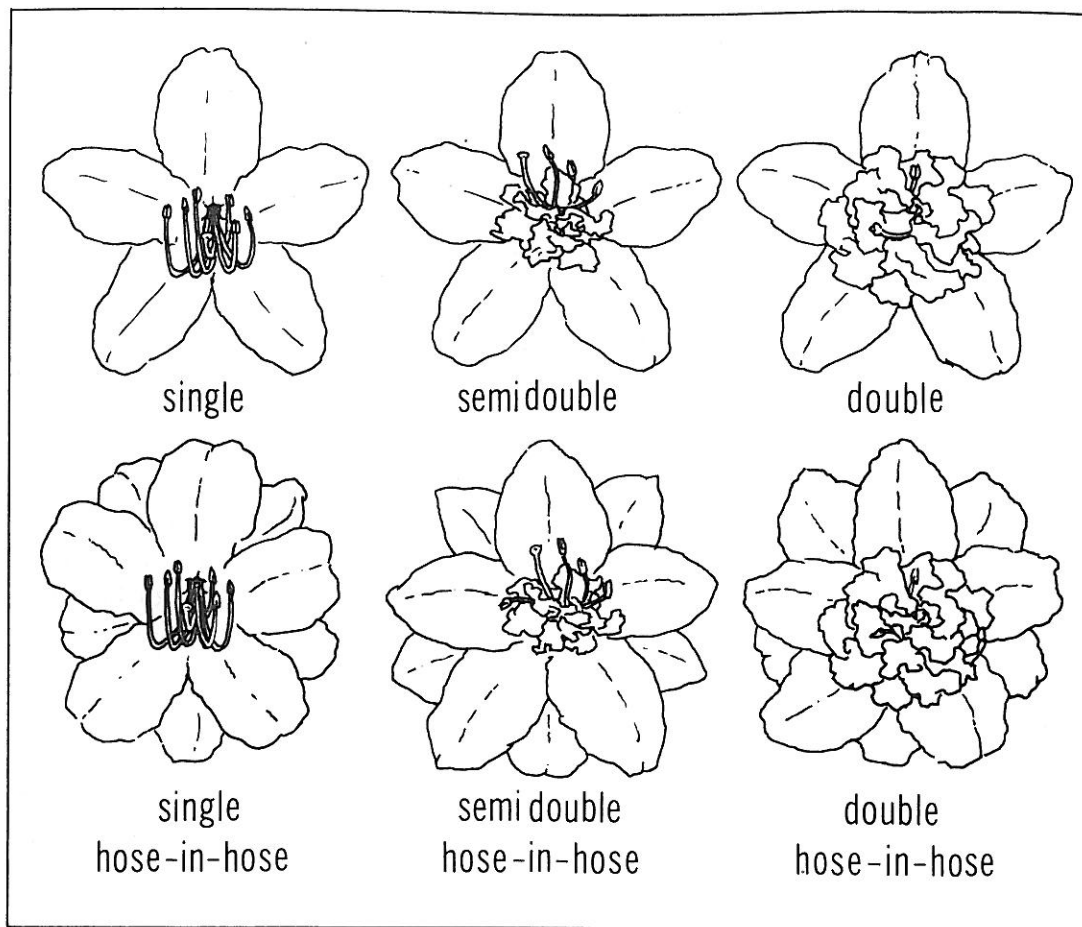
A beautiful study on the morphology of the capsules, seed, and calyx was done by Dr. Johannes Hedegaard titled, *Studies in the Genus Rhododendrons*.

### FLOWER FORMS

Azalea flowers vary, often with one or more types on a single plant. The most common azalea flowers are single with five lobes. However, with increased petals through the metamorphosis of sepals, stamens, or both, various doubling effects occur that vary the flower's appearance. Even the shape of the petals will alter flower appearance. The indiscriminate use of terms such as semidouble, double, fully double, and others are often misused and misleading in describing flower form and appearance.

Unfortunately, the American Rhododendron Society has not promoted a classification of azalea flowers, but the following classification may be helpful.

- I. Single types: The most common azalea flower form consists of a corolla of five or more petals or corolla lobes usually fused at the base. The calyx consists of five sepals and five calyx lobes usually fused at the base. Finally, there are five to ten stamens and a single pistil. The conspicuous stamens and pistil give this type its distinctive appearance. Examples: Kurumes, 'Hinodegiri', 'Debutante', 'Sherwood Red'; the species *R. kaempferi*; Glenn Dale hybrids, 'Treasure', 'Martha Hitchcock' and 'Ben Morrison'; Satsuki, 'Gumpo', 'Kobai', (five to seven petals).
- II. Hose-in-hose: A non-botanical term and often used when the sepals are fully metamorphosed, enlarged and transformed into petals. Another description would be: Hose-in-hose, one corolla superimposed inside another or two cycles of petals one within the other. The petal-like calyces have been rotated with respect to the corolla and can be seen together with the petals. The calyx may or may not be present. In many early descriptions the presence of a calyx was not recorded. For the future, when known, the presence of a calyx should be recorded as Hose-in-hose, calyx present or green calyx present. If it is not stated, one can assume that the calyx is absent or not known. In irregular or partial hose-in-hose flowers, the calyx petals are only partially developed and cannot be seen from the front of the flower. A hose-in-hose configuration may also be found in semi and double flowers.
- III. Semidouble types: Flowers with a true corolla but in which some of the stamens have been transformed into petals and with true or only partially transformed sepals. The transformed stamens are smaller than the true petals or contorted, or the anther or filament of the stamen remains evident. In addition, there may be a few normal stamens or a few stamens fully transformed into petals. Examples: Belgian hybrid, 'Crimson Glory', Southern Indian, 'William Bull' (may also be double).



- IV. Semidouble hose-in-hose types: Same as above with the calyx fully developed and visible and transformed to petals. The calyx and corolla look alike. Examples: Pericat hybrids 'Glory'; 'Rival' and 'Sweetheart Supreme'.
- V. Double types: Flowers with true petals and complete or nearly complete transformation of stamens into petals. The green calyx or a small remnant is present. The pistil may be present or transformed. The petals may be up to thirty or more. Example: Gable hybrid, 'La Premier'; Satsuki, 'Beni-kirin', 'Balsaminaeflorum'.
- VI. Double hose-in-hose type: similar to the double type but with hose-in-hose characteristics and the calyx not present. Example: 'Anna Kehr'. Many flowers described as double hose-in-hose have a remnant of a green calyx present and should be labeled as double hose-in-hose, calyx present.
- VII. Spider type: The petals are not fused, forming a tube, but are separate, narrow, and strap-like. Typical examples are *R. macrosepalum linearifolium*, the cultivar 'Koromo-shikibu', and the Satsuki, 'Kinsai'. There is considerable variation, with often more than five narrow petals and examples where the stamens appear as narrow petals. While not common in deciduous azaleas, the cultivar, 'Chattahoochee' is a spider type, as is the triploid, *R. atlanticum f. tomolobum*.

## FLOWER SHAPES

The variations in flower types and shapes as well as in size, color, and blooming period create differing esthetic effects and untiring charm. They should lead the perceptive and sensitive gardener to make a wide selection of cultivars.

Flower shapes vary and have often been described as types. Pointed petals produce a star effect. Other flower shapes include rounded petals and those whose margins are frilled, ruffled, or wavy. The flowers may be tubular, funnel-formed, or bell-shaped, while others have large, flat flowers without a prominent tube such as *R. schlippenbachii*. Combinations of the above produce interesting flowers as in 'Mayo's Magic Lily' which has a large tubular flower, with slightly pointed petals and partially petaloid sepals.

The form of the flower commonly varies among plants. This variation may be natural so that the flowers on two identical plants in the same area are different. Or flowers may differ from one area to another. A plant may be semidouble in one place and double in another. Spider types may have perfect flowers on the same plant.

## FLOWER SIZE

The length of a flower is the distance from the base of the tube to the level of the top of the flaring petals. The width is the distance between the tips of the two upper wings or petals. The size of flowers vary from the tiny blossoms of the Tschonoski Azalea, *R. tschonoskii*, and Wild Thyme Leaf Azalea, *R. serpyllifolium*, to flowers of the new cultivars that often measure four to five inches across.

## FLOWER CLUSTERS

Each flower bud may produce a single flower, a cluster, or an umbellate raceme, of up to 20 or more flowers. The number of flowers varies within each species. The more flowers to the cluster, the showier and more Rhododendron-like is the effect. Variations of season, environment, age, and health of the plant also affect the number of flowers to a cluster. Kurume, Back Acre, and other azaleas have only a few flowers to the cluster but, due to the denseness of branching, give a massive flower effect.

Some of the ball trusses or large flower clusters as noted on the Oconee Azalea, *R. flammeum (speciosum)*, and others may be genetic but still vary depending on the health and vigor of the plant.

The approximate numbers of flowers in a cluster for some species is as follows:

<i>R. alabamense</i>	6-30	<i>R. occidentale</i>	10-30
<i>R. arborescens</i>	3-6	<i>R. phoenicum</i>	1-30
<i>R. calendulaceum</i>	5-25	<i>R. poukhanense</i>	1-3
<i>R. flammeum</i>	5-30	<i>R. prinophyllum</i>	5-9
<i>R. indicum</i>	1-2	<i>R. scabrum</i>	2-6
<i>R. japonicum</i>	5-12	<i>R. schlippenbachii</i>	3-6
<i>R. luteum</i>	7-12	<i>R. simsii</i>	2-6
'Mucronatum'	1-3	<i>R. vaseyi</i>	5-8
<i>R. kaempferi</i>	1-5		

The flower buds are at the tips of the branches, but a branch tip may have two or three flower buds, instead of a single bud, thereby increasing the cluster.

## FLOWER COLORS

The beauty of azaleas resides in part in the marvelous range of color in the flowers. The colors are due to two main classes of chemical compounds or pigments. The fat-soluble carotenoids compounds are found in specialized protoplasmic bodies of the cell and provide yellow, orange, and red pigments. The anthocyanins belong to the water soluble flavonoid group of pigments and are responsible for the majority of pink, red-violet, and blue colors in flowers.

The complete function of pigments in flowers is not understood. The colors do attract pollinating agents. In general, bees prefer yellow and blue flowers; birds, red and orange; butterflies, bright colors, and moths, white or pale colors, in their search for nectar. Some pigments are invisible to humans but still guide insect pollinators that "see" by ultraviolet or infra-red perception.

The study of flavonoids in leaves and flowers of *Rhododendron* is ongoing among scientists in England, Germany, Japan, and the United States. The presence or absence of flavonoid compounds are potentially taxonomic markers. As more research and chemical data become known, flavonoids may provide additional tools for classification together with the morphological characters of plants.

Hybridizers will also find the information of value. For example, the violet colors in some azaleas are generally due to the presence of malvidin 3, 5-diglucoside, the mauve pigment of many wild species. It has also been reported that an orange sport of "Red Wing" is due to the absence of a flavoid pigment as contrasted with its presence in the parental form.

Based on 58 flavonoid substances from the leaves of plants of the sub-genus *Pentanthera*, the species can be divided into five alliances. Also of interest, these same species lack the flavonoids gossypetin and coumarins common in most other *Rhododendron* species.

The chemical pigments determine the great variability of flower colors on the same plants as in the Satsuki and Glenn Dale cultivars where more than one color and different color designs are found on flowers of the same plant.

From biochemical studies in Japan, the Satsuki cultivars are divided into five groups based on their anthocyanin complement. Also 161 cultivars of Kurume Azaleas have been classified into seven groups. Some individual cultivars can be distinguished by their anthocyanin complement. However, for the complete identification of all azalea cultivars, more research on the flavonoids will be required.

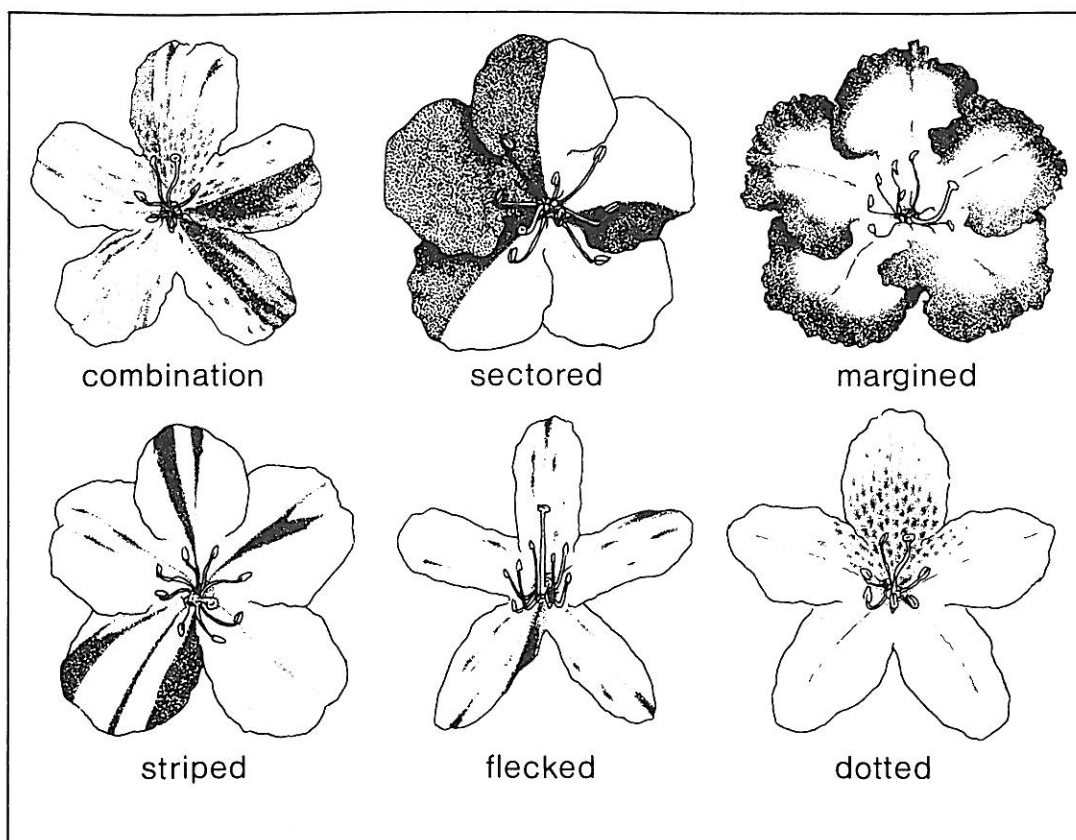
Various terms are used to describe color patterns:

**Self.** All of one color.

**Blotches.** The attractiveness and color effect of many azalea flowers is accentuated by a blotch of a different color on the standard or top petal, which often extends to the two upper wings or petals. The blotch may be lighter or darker than the ground color.

**Striped Flowers.** Striped flowers have a peppermint stick appearance, a white flower striped, dotted, or flecked with another color such as pink, red, or magenta. There may be flowers of different colors on the same plant. This is common on Satsuki Azaleas. For example, the cultivar 'Ho-raku' often has flowers that are white with a chartreuse blotch, white with faint dots of purplish red, white flecked or striped purplish red, half purplish red and half white with dots, and purplish red selfs. Such variations in color among flowers on the same plant are characteristic of the Satsuki Azaleas, common among the Southern Indian Azaleas, and occasionally found among the Glenn Dales and Kurumes.

**Bordered or Margined Flowers.** Some white flowered azaleas have a colored margin or colored flowers with white margin. The effect is that of the throat differing in color from the rest of the flower. This very pleasing effect is found in Satsuki, Glenn Dale, Back Acre azaleas, and others. According to a Japanese authority, Satsuki cultivars ending in 'no tsuki' are only bordered flowers, but frequently in their books they show the same azalea with variations.



**Sectorial Flowers.** These color variations may at times arise from sectorial chimaeras or variegations, where an identical sector or wedge of a flower on a stem or on all stems of a plant has a different color from the rest of the flowers. Such chimaeras probably have a genetic basis. They are not graft chimaeras or graft hybrids resulting from development of a bud and branch at the point of union of a stock and scion. Where the dominant flowers are white, striped, dotted, flecked, or sectored in a particular color, the plant is likely to produce occasional branches with self-colored flowers of that color. Branches with these self-colored flowers may be pruned out if a more uniform plant with the striped, dotted, flecked, or sectorial flowers is desired.

Azalea cultivars with these variations in flowers are admired by partisans and condemned by opponents. Often a flecked or dotted azalea appears as white from a distance, but when examined closely a different color combination is seen.

A plant with striped, dotted, flecked, bordered, or sectored flowers is not fixed except in the sense that it will continue to produce a known range of variants. These variants in order of common occurrence are:

1. Self-colored flowers of the color of the stripe.
2. Flowers characterized both by a white ground flushed with a hue derived from the color of the stripe, but usually lighter in tone, and by an irregular white margin.
3. Flowers with a white base and a margin of the color of the stripe.
4. Sectorial flowers with a wedge or half of the flower with the color of the stripe.
5. Least often, white flowers.

Cuttings taken from the branches showing any of these five variations tend to produce plants with the particular variation. Cuttings taken from the striped, (or dotted, flecked,



bordered, or sectored) branches of the original plant produce plants that continue to throw the complete range of variants. This behavior has been observed in the Glenn Dales, Robin Hills, and Satsuki Azaleas and occasionally in the Belgian hybrid Azaleas.

**Color.** Clarity is important in describing plant and particularly flower colors, hues, tints, and shades. Comparison with a standard color chart and the use of commonly accepted color would be a marked improvement over today's practice. Unfortunately, color charts used for identifying and classifying flower color are no longer available. Those published in the past include the *Royal Horticultural Society Colour Chart*, (R.H.S.) published in 1966, the two volume *Horticultural Colour Chart*, (H.C.C.) published in 1944 by the Royal Horticultural Society, *Ridgeway's Color Standards*, (R), and the *Nickerson Color Fan* (N).

Color names are often misleading. To describe a red-headed woodpecker the color of red is relatively simple. However, in describing a flower color under various environmental conditions, the names used are often confusing and difficult to interpret by different users. The following names are often used to describe the same flower color: Amaranth-Pink, Pink, Phlox-Pink, Daphne-Pink, Rose, Neyron-Rose, Orchid-Rose, Cameo-Pink, and even Pink-Icing, Teenage-Pink, and Bridesmaid-Pink.

The color names used in this book are taken from the National Bureau of Standards (NBS) Special Publication 440, *Color Universal Language and Dictionary of Names*. The Inter Society Color Council (ISCC) and NBS have developed a method of designating colors related to the Color Names Dictionary.

All those color names in the list of the previous paragraph would use the Color Dictionary Names deep purplish pink or deep Pk (dark purplish pink is shown intact as d.p Pk). The ISCC-NBS Color Names follow a simple standardized formula which differentiates 267 blocks in the color spectrum, about the limit of different colors that one can remember.

The method in principle is simple. The terms *light*, *medium*, and *dark* designate degrees of value, and the adverb *very* is used to extend the range—thus "very light" and "very dark". These, and a series of hue names, used both as nouns and adjectives, are combined to form names for describing color in terms of its three perceptual attributes: hue, value, and chroma. For the colors of medium value or lightness, the adjectives "grayish", "moderate", "strong" and "vivid" designate increasing degrees of chroma. For colors of higher value, the adjectives "pale" (or "light grayish"), "light", "brilliant" and "vivid" are used for the darker colors. Increasing chroma is reflected in the modifiers "dark grayish", "dark", "deep", and "vivid". The following pages contain all the hue names and abbreviations used in the ISCC-NBS system.

It is possible to convert many of these color numbers to the Royal Horticultural Society *Colour Chart*. Numbers and names correspond to the ISCC-NBS names such as 5YR8/7 light orange, 2.5R7/8 strong pink and others. Since the names used in the Nickerson fan are the NBS names, the numbers from old records and registrar lists will be eliminated.

The old Ridgeway Color names can be converted to ISCC-NBS names with the aid of the color dictionary, such as LaFrance pink=vivid pink, Rhodamine purple=vivid purplish red, Spinel pink=strong purplish red, Rose doree=deep yellowish pink, and others.

The ISCC-NBS names describe but do not pinpoint the true color. Thus, several adjacent colors from old color charts may have the same descriptive name, however, when possible the R.H.S. numbers will be included.

## LEAVES

Azalea leaves possess esthetic features often overlooked. The obvious characteristic is an evergreen or deciduous species or cultivar. However, the size, shape, color, arrangement, and hairiness all add interest to a particular plant. The morphological characteristics of the leaves are a help in identifying species and assist in deriving the parentage of hybrids.

**Leaf Size.** The Wild Thyme Azalea *R. serpyllifolium* has elliptically shaped evergreen leaves 1/4 to 1/3 inches long. The 'Tschonoski Azalea' has narrow lanceolate, deciduous leaves 1/3 to one long, and 1/6 to a half inch wide.

At the opposite extreme, the uncommon Nippon Azalea *R. nipponicum* has deciduous leaves up to seven inches long and three inches wide. Both the Japanese Azalea *R. japonicum* and the Plumleaf azalea *R. prunifolium* have long leaves up to five and six inches long. More commonly, azalea leaves are one to two inches long in the evergreen species and three to four inches long with deciduous species.

**Persistence of Leaves.** The major division of azaleas is determined by persistence of leaf—deciduous azaleas lose their leaves in the winter while evergreen azaleas leaves are persistent. Most of the deciduous species are natives of the eastern United States; all the evergreen species come from eastern Asia. The designation of the two major groups of azaleas as deciduous or evergreen is, at best, only an approximation of the truth and may vary depending upon the climatic conditions.

**Deciduous Azaleas:** The deciduous azaleas do lose their leaves in the fall and put out new leaves in the spring, similar to many broadleaf flowering plants in colder regions.

**Evergreen Azaleas:** The group of persistent or evergreen azaleas often straddle the fence by being both deciduous and evergreen. They have dimorphic leaves, known as spring leaves and summer leaves. The spring leaves, unfolding at the time of flowering or immediately after, are thinner, lighter and generally larger than the summer leaves, and usually scattered along the branches. These leaves are short-lived, turning yellow and dropping off in the fall.

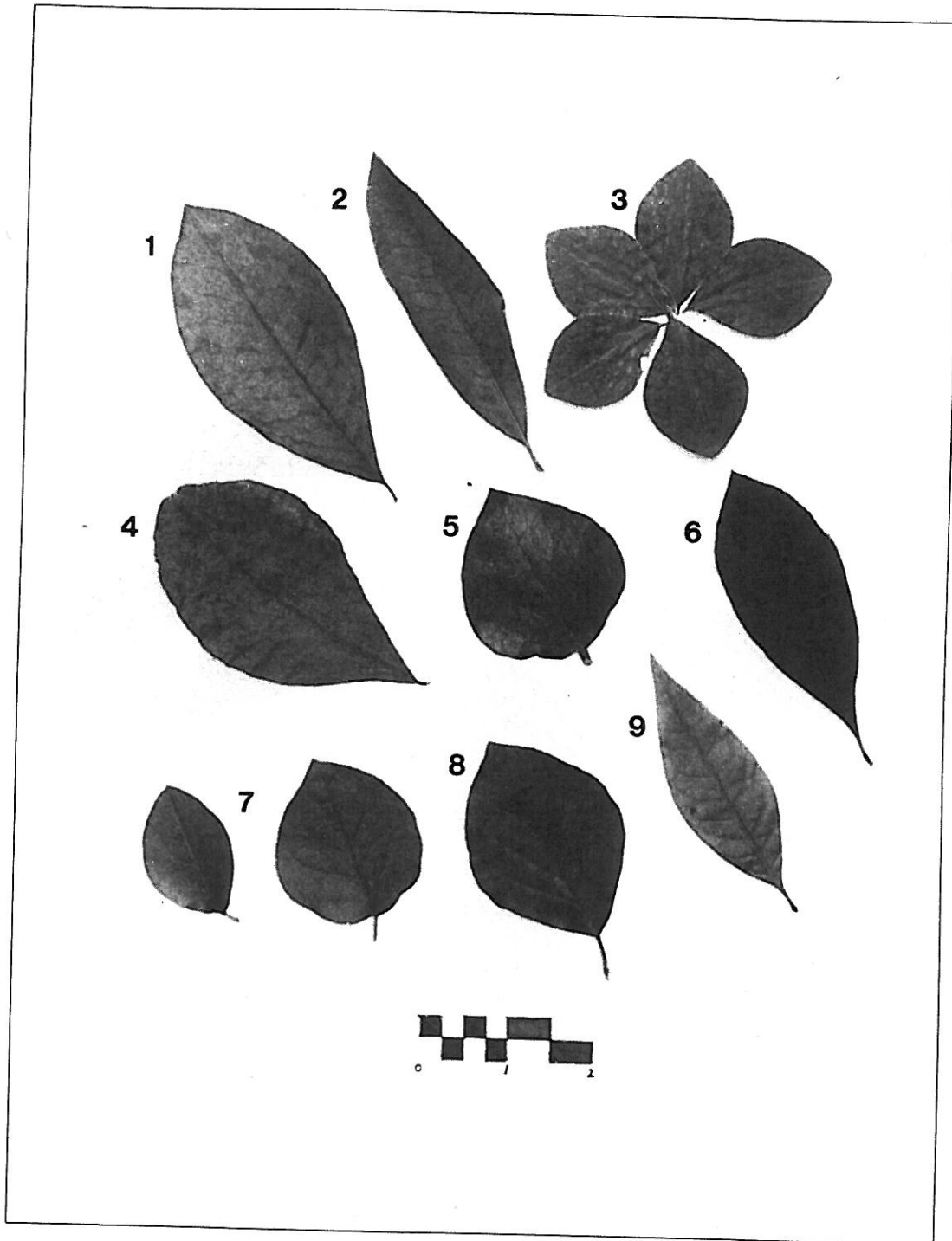
Leaf drop is hastened by summer drought. Novice gardeners often fear their evergreen azaleas are dying in the fall when the plants are merely shedding their spring leaves.

The summer leaves unfolding in early summer are smaller, darker, thicker, and more leathery than the spring leaves and are crowded at the tips of the branches. In most instances, the summer leaves are persistent and remain throughout the dormant period of winter until the following spring. In some cases the summer leaves of evergreen azaleas growing in warm climates may persist for several years.

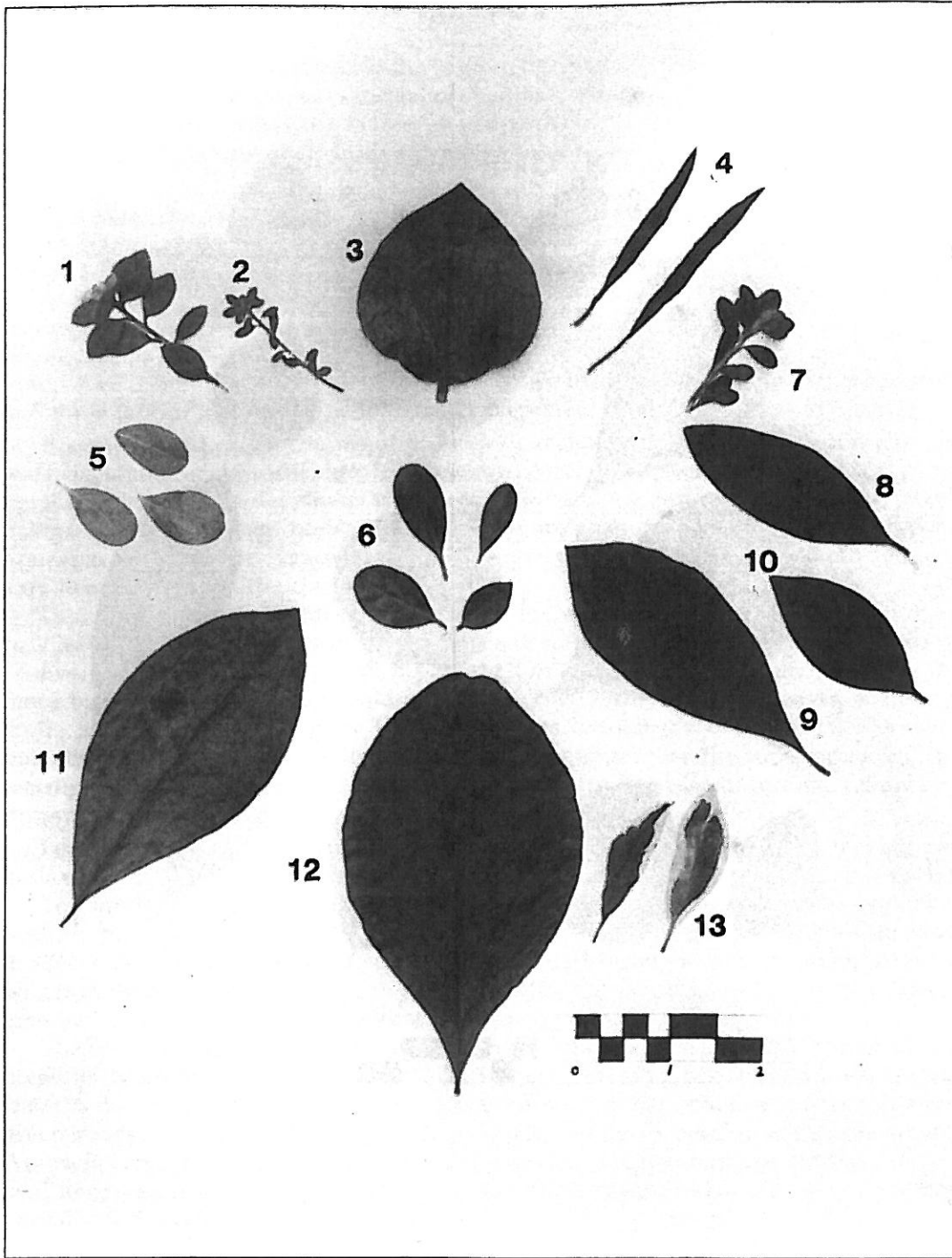
The designations deciduous and evergreen are dependent on the climatic area and this accounts for the term persistent leaves. For example, the Hammock-sweet Azalea, *R. serrulatum*, is deciduous in warm temperature regions but will have persistent or nearly evergreen leaves in subtropical regions. Both the Korean Azalea, *R. poukhanense*, and Kaempfer Azalea *R. kaempferi*, are evergreen in warm temperature regions but usually deciduous in cool temperature regions. Thus, at best, evergreen azaleas are partially evergreen and partially deciduous.

## LEAF SHAPES

The leaves of azaleas vary from obovate to ovate, to lanceolate, oblanceolate and some almost round or oblong. The Satsuki Azalea 'Kazan' (Rukizon) has small, broadly ovate leaves often described as heart-shaped, while the Spider Azalea, *R. macrosepalum linearifolium* has long, narrow leaves from one and a half inches to three inches long, but only 1/12 to 1/4 inches wide. Leaves, too, may be contorted or twisted as in the Satsuki cultivars, 'Rinpu', 'Saikan', 'Shungetsu', and others.



Azalea Leaves  
1. Knap Hill-Hybrid  
2. *R. japonicum*  
3. *R. quinquefolium*  
4. *R. schlippenbachii*  
5. *R. reticulatum*  
6. *R. canescens*  
7. *R. nudipes*  
8. *R. weyrichii*  
9. *R. vaseyi*



Azalea Leaves

- |   |                                 |
|---|---------------------------------|
| 1. <i>R. nakaharai</i>                  | 7. <i>R. kiusianum</i>          |
| 2. <i>R. serphyllifolium</i>            | 8. <i>R. simsii</i>             |
| 3. <i>R. reticulatum</i>                | 9. <i>R. canescens</i>          |
| 4. <i>R. macrosepalum linearifolium</i> | 10. <i>R. indicum</i>           |
| 5. <i>R. sataense</i>                   | 11. Knap Hill Hybrid            |
| 6. Kurume Hybrids                       | 12. <i>R. schlippenbachii</i>   |
|   | 13. Southern Belle (variegated) |

## LEAF COLOR

Leaves vary from the light green of the deciduous azaleas to the dark green of the summer leaves of many evergreen azaleas. White to light flowered azaleas usually have lighter green leaves and generally display less fall coloration and remain green, for example, 'Snow', 'Glacier', and 'Coral Bell'. Thus, from a planting of small seedlings, one can pick out those which will be light pink or white by the winter color of leaves.

The fall coloring of deciduous azaleas ranges from pure yellow through crimson to vinous-purple. The leaves of many evergreen azaleas through the fall and winter are green flecked with bronze or rust or carry red or dark red leaves. This is more common in the red to purple flowered cultivars. For example, the Glenn Dale Azaleas 'Campfire', 'Copperman', 'Fashion', 'Glamour', 'Kathleen', 'Phoebe', 'Refulgence', 'Rhapsody', 'Winner', and 'Zealot' display fall coloration in bronze or copper shades. Often the fall coloration occurs on both sides of the leaf with the under surface being lighter; in other cases the lower surface remains green.

A few years ago azaleas with variegated foliage were uncommon save for a few Satsuki cultivars such as 'Keisetsu' and 'Ukinishiki' with light yellow blotches scattered on the dark green foliage. A marginal variegated plant of *R. simsii* PI 391401, NA 36749, was first introduced to the University of California Botanical Garden in Berkeley from the U.S.D.A. and National Arboretum now believed to be sold as 'Purple Tabor' and other names. Two variegated Satsuki azaleas introduced from Japan are 'Shirafuji' and 'Murasakifuji'. In the 1980's four marginal variegated plants were introduced in the United States: 'Southern Bell', a sport of 'Pink Ruffles' and 'Red Ruffles Variegated'; 'Silver Streak', a Greenwood hybrid which is a sport of 'Deep Purple'; 'Girard's Variegated Gem', a sport of 'Border Gem'; and 'Silver Sword', a sport of 'Girard's Rose'. The latter turns a beautiful reddish tint in the fall while the others retain their greenness. A freckled leaf sport of 'Southern Charm' was introduced in the late 70's.

Variegated deciduous azaleas are very uncommon. A seedling was reported from Ohio but later died. The author has a two-year seedling of a North American azalea cross with both marginal and flecked variations of the foliage. A marginal variegated plant of *R. canescens* was collected in North Florida in 1981 by Bob McCartney of Aiken, S. C.

## LEAF ARRANGEMENT

Azalea leaves are borne either alternately on the stem or in a spiral pattern. The spirals are often condensed, with the leaves crowded at the tip of the branches so they appear to be star-like whorls. In certain species, leaf arrangements become one of the main attractions. The following azaleas have whorls of five leaves at the end of the branches: Cork azalea *R. quinquefolium*, Five Leaf Azalea *R. pentaphyllum*, and Royal Azalea *R. schlippenbachii*. Many evergreen species, such as *R. kaempferi*, have leaves crowded at the ends of branches but without the appearance of whorls.

## LEAF HAIRINESS

The function of leaf hairs is a matter of conjecture, and in fact may be a relic or subsidiary appendage making no special contribution to the well-being of the plant.

The pubescence or indumentum of azalea leaves is sparse compared with the leaves of many other species of *Rhododendron*. Some azalea leaves are glabrous, bald or not hairy, at maturity. Some have hairs only on the underside of the leaves along the veins. The pubescence of azalea leaves consists of hairs which may be straight or sometimes curly, but never branched, and usually closely adpressed to the surface of the leaf. The hairs are visible to the naked eye, and with a hand lens or low powered microscope one can see that they are flattened or laminated and not cylindrical. The hairs may be of uniform size, or as in the Piedmont Azalea *R. canescens*, may occur as a dense, felty pubescence of numerous,

whitish and relatively short hairs, interspaced with occasional longer, thicker and more bristle-like hairs or setae which impart a strigose character to the leaf surface.

Bristle-like setae are usually sharp-pointed. But in some species such as the Coastal Azalea *R. atlanticum* and the Alabama Azalea *R. alabamense*, they are gland tipped (glandular setae), which cause the leaves to be sticky as they first unfold. Under the microscope these bulbous glands vary within plants of the same species from straw-yellow, through pink to deep red. Occasionally, small insects are trapped upon the sticky glands.

Hairs of azalea leaves may vary from yellow through bluish green to reddish. On young leaves, particularly of 'Indica Alba' and its allies and the Piedmont Azalea *R. canescens*, Roseshell Azalea *R. prinophyllum* and others, the hairs may be nearly white.

The Oldham Azalea *R. oldhamii* is one of the hairiest azalea species with conspicuous reddish brown hairs on both sides of the leaves and stems. The leaves of *R. rubropilosum* are also covered with numerous short hairs typically reddish brown in color. Some azaleas have hairs on both sides of the leaf such as 'Indica Alba', while others are hairy only on the underside such as the Big Sepal Azalea *R. macrosepalum*.

### LEAF GLAUDESCENCE

Leaves of some species, such as *R. canadense*, have a gray waxy covering or bloom on the underside. Such leaves are said to be glaucous, like the skin of some plums. The bloom can be rubbed off. In some species as the Swamp Azalea *R. viscosum* and the Coastal Azalea *R. atlanticum*, some individuals have glaucous leaves while others do not. Plants with glaucous leaves occur haphazardly throughout the population so glaucescence is not a clear segregating characteristic. Unfortunately, it has been used by botanists as the basis for varietal status.

Without a hand lens, glaucescence and fine white hairs are easily confused, since both give the underside of a leaf a gray appearance. Like hairs, the function of glaucescence is not known.

### LEAF ODOR

The leaves of many azaleas when opening in the spring have an unpleasant musky odor. This is usually noted in early morning or in the confined air of a warm place such as a greenhouse.

The Chinese and Japanese azaleas *R. molle* and *R. japonicum* and their hybrid offspring have foliage that is noticeably odoriferous in hot summer weather.

The leaves of some azaleas, as the Sweet Azalea *R. arborescens*, when dry have a persistent vanilla- or coumarin-like fragrance. Fresh leaves of *R. arborescens* have a spicy fragrance when crushed.