

RHODODENDRONS

A BRIEF EXAMINATION OF SERIES,

SPECIES, CULTURE AND LANDSCAPE USE

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## A BRIEF EXAMINATION OF SERIES, SPECIES, CULTURE AND LANDSCAPE USE

Winfred Bunt, in her book, *Garden Shrubs and Their Histories*, notes that if the rose is the queen of shrubs, then surely the rhododendron is the king - unbeatable for beauty, variety and adaptability, the vast genus looms like a Himalayan peak among the lesser families.

Grant (1943) observes that the rhododendrons constitute without question the most important single genus of broad-leaved evergreen shrubs for the Pacific North West, but until recent years the best known rhododendrons were the older garden hybrids which, in many instances, entirely lack the charm and individuality characteristic of the species. The once exclusive rhododendron whose charisma for almost three quarters of a century was created by a general association with high cost, great estates and the esoteric indulgences of the wealthy, is now well within the reach of the enthusiastic gardeners of moderate means.

Rhododendrons are distributed throughout the northern hemisphere. There are four species in Europe, 17 in North America and well over 1000 in Central and Eastern Asia. Of these, by far the largest number is found in upper Burma, Tibet and the Western Chinese provinces. Their range extends all the way from the tropics to the alpine regions. One species, *R. lapponicum*, for example, literally surrounds the North Pole region (Van Veen 1969). Enormous exotic species, with blossoms of brilliant hue inhabit the tropical and sub-tropical jungles; yet there are miniature species which extend beyond and above the treeline, almost to the brink of the eternal snows.

It is a truly remarkable genus, many species with magnificent blossoms, with a variety of colours, shapes, habits, and foliage shapes, sizes and textures, that rivals any other plant on earth. It is this very variety of characteristics, as we shall see later, that have provided the key to classifying this huge genus.

There is a fascinating history to the introduction of the rhododendron (From

Rhododendros - meaning Rose Tree; originally used by the Greeks for Oleander but officially established and christened by Linnaeus in 1753), fossil evidence shows rhododendrons to have existed in the Miocene age. The first species known to science were probably the alpine ones - *R. ferrugineum* and *R. hirsutum* - which were described under various names by Clusius and other 16th century botanists. The first cultivated rhododendron, *R. hirsutum*, was certainly growing in Tradescant's garden before 1656. It was not, however, until the beginning of the 1800's, with the arrival of the first Himalayan species, the blood red form of *R. arboreum*, found by a Capt. Hardwicke in 1796 and distributed in England, that the beauty and potential of the genus began to be recognized. This, of course, coincided with the rise of an educated artistically cultured and wealthy class of landed gentry who saw in the plant an opportunity to compare and compete with his wealthy friends. It is fortunate, however, that many who went to collect rhododendron species from far flung reaches of the world were often most accomplished botanists. Their collections and publications are an awesome heritage (see *Rhododendrons of the Sikkim Himalays* (1849) the first of many sumptuous monographs on the genus).

Collecting has continued unabated from the mid-1700's, though perhaps it reached its peak before the turn of the century. The gardener of today has been left with an incomparable legacy of beautiful plants, both hybrids and species with which to enhance our living landscape.

The purpose of this paper is to briefly examine the classification, culture, care and uses of this, one of the most beautiful of shrubs.

### CLASSIFICATION OF RHODODENDRONS

The genus *Rhododendron* belongs to one of the two dozen great families of flowering plants, the Ericaceae. *Rhododendron* is a very successful genus, with something between 900 and 1000 species discovered so far. It seems to be still in the course of evolution, as many species are very variable. Many of the more widespread species have a number of geographical forms - often when first discovered, they were described as separate species but when intermediate forms were subsequently discovered it became

the the whole complex was, in fact, one variable species. By 1916, there was still no systematic classification for this rapidly growing genus of flower. It was Sir Isaac Bailey Balfour, keeper of the Royal Botanic Garden at Edinburgh who eventually established the present classification framework, currently used in the western world. Balfour sorted the species *Rhododendron* into series based largely on botanical similarities. Habit of the plant, its leaf shape, the presence or absence of scales, the occurrence of hairs, the presence and appearance of glands, the number of parts in the calyx and corolla, and the shape and colour of the latter, in particular, the number and positions of the stamens and the shape and appearance of the ovary and fruit, all served to assist the organization of this genus. It is divided into 44 series, each called after one of the constituent species. (Where there are a large number of species, within any one series, these are often subdivided into sub-series; on the other hand, some, like the *Griersonianum* series, contain only one species.)

There is a great divide within the genus between those species with scales - the lepidote species - and those without scales - the elepidotes. There are 23 lepidotes and 21 elepidote series. The elepidotes are usually larger than the lepidotes, although there are exceptions. Although scales and hairs have a common origin, the two groups are thought to have diverged a very long time ago and have been developing along parallel lines. The scales are like little structures on short stalks, often like small, flattened mushrooms. They can easily be seen with a hand lens and are usually thickest on the underside of the leaf. Their function appears to be that of preventing water loss by transpiration, as a layer of humid air will be trapped under the scales next to the leaf's surface. Hairs can be seen in both groups, in some series they are fine and not very obvious but in others, for example *Barbatum*, they are like stiff bristles. It is interesting to note for both the hybridist and the botanist that there are few natural crosses between the series of *rhododendrons* in the wild and there are almost no crosses between lepidote and elepidote species. An exception is the hybrid "grierdal" between *R.dalhousiae* and *R.griersonianum*.

A number of revisions to the system of classification have been suggested. Prominent amongst the revisers are Dr's Rehder and Sleumer, however, the Balfour system is still largely intact. The following is a very brief summary of each of the series with the exception of the Malasian species. Apologies are due to Cox (1973), Kindon Ward (1949) and Stevenson (1930) from whom much of the information has been derived.

### A Brief Description of the Series

Albiflorum Series: This series contains only one species with small, hanging white flowers. One to six feet tall, deciduous, difficult in cultivation, needs very acid soil.

Anthopogon Series: These are dwarf and compact with small, dark, aromatic leaves and small, daphne-like flowers in terminal clusters. This series does best in full exposure. Flowers April and May. Not always very hardy.

Arboreum Series: Species in this series vary from large bushes to fair-sized trees. *R. arboreum* is a magnificent species growing to over 40 feet in the United Kingdom. Very early flowering and may be frosted. (2 subseries)

Auriculatum Series: Containing only one species, (Cox includes *R. griersonianum*) *R. auriculatum* is a spreading tree to 20 feet or more. Flowering in July and August, the blooms are up to four inches across, scented and white or pink. Often problems with poor flowering because it does not set buds.

Azalea Series: This is a large series divided into six subseries not covered in this paper.

Barbatum Series: This series has stiff, bristly hairs on twigs and leaf-stalks. Generally early-flowering, some are graceful small trees. *R. barbatum* is reputed to attain tree stature in the wild. Compact flower trusses, in March Blood-red (4 subseries).

Boothii Series: This is a tender series and not much used in cultivation. *R. sulfereum* with sulphur yellow blooms in tiger truss is sometimes sold. (3 subseries)

Campanulatum Series: This Himalayan series resembles the Arboreum series but has rounded instead of pointed leaf tips. Hardy, tall growing with distinctive foliage.

Campylogynum Series: With only one species in the series, *R. Campylogynum* has thimble-like flowers on the ends of erect stalks, only up to 3 feet high with various pink flowers in May.

Camelliaeflorum Series: An old Himalayan species normally growing as an epiphyte. Suitable only for cool greenhouses.

Camtsclaticum Series: *R. camtsclaticum* is the only species of this series in cultivation. Deciduous, it often creeps along the ground attaining a height of about six inches. Large, reddish-purple blooms, in May or June flowers on current season's growth.

Carolinianum Series: Native to the United States, this series is noted for being able to tolerate heat. The species have elliptical leaves with long-tubed flowers blooming in May and June, usually rose-coloured.

Cinnabarinum Series: A very popular series, *R. cinnabarinum* is one of the best of the lepidote rhododendrons. Flowers are pendant and tubular, waxy-textured, reddish and purple colours, two or three inches long, hanging in groups at the ends of the branches. Foliage often bluish.

Dauricum Series: This series, early-blooming and twiggy, comes from Siberia. Two forms, deciduous and evergreen. Hardy, purple and can flower as early as January.

Edgeworthii Series: A small series, only two species are of horticultural importance. Members have both scales and wooly hairs on the undersides of the leaves. Mostly epiphytes in nature.

Falconeri Series: This is a series of big rhododendrons, useful for foliage effects. Most species have large, dark green leathery leaves. Providing wind shelter is important for this series.

Ferrugineum Series: Native to Europe, an Alps, one of the species, *R. hirsutum*, is reputed to be the first cultivated rhododendron. Sometimes found in limestone areas, worth more attention as hardy and despite being leafy have beautiful flowers even on young plants.

Fortunei Series: This series has been used extensively in hybridization. The leaves are usually smooth and rounded. The flowers often have seven or eight lobes instead of the usual five with twice the number of stamens. Six extensive subspecies *R. fortunei* is said to now be very rare as a true type.

Fulvum Series: This series is noted for its superb foliage. Only two species, with white to non-coloured flowers, tree-flowering in March.

Glaucophyllum Series: This is a series of semi-dwarfs reaching a maximum of five feet with dark, aromatic foliage (2 subspecies of which only *glaucophyllum* produces useful plants for cultivation).

Grande Series: This is the largest leaved series in the genus and needs both shelter and humidity. *R. giganteum* may grow to 90 feet in the wild.

Griersonianum Series: With only one species, *R. griersonianum* is open and straggly to ten feet with long-tubed, large flowers of a soft geranium scarlet. A very important and distinctive species. It has been extensively hybridized.

Heliolepis Series: Not much grown in cultivation, these species grow up to fifteen feet.

Irroratum Series: One of the largest series, with two subspecies. Although very beautiful, most plants are quite tender.

Lacteum Series: This series does well on very acid soil but is slow growing and short lived. Important for its yellow species.

Lapponicum Series: With over 50 species, this is a widely grown series. Most species have mauve flowers and small, greyish-green leaves. Most are under two feet in height. One of the most important series for the small garden owner. Hardy with most colours being found all the time including yellows and pinks.

Lepidotum Series: Most of these species are under five feet tall. Two subseries with *Baileyi* the only member of one subseries. Most members flower in June.

Maddennii Series: A large series with many beautiful species. Often tender and straggly in appearance, flowers are often scented. Three subseries with *Megacalyx* the most important.

Moupinense Series: Only *R. moupinense* is in cultivation and has been much used in hybridization. Growing to five feet, it flowers in late February and March. Foliage is dark and glossy.

Neriiflorum Series: An important series for gardeners, the *Neriiflorum* rhododendrons almost always have red, waxy-textured, tubular-campanulate flowers in open loose trusses. Flowers in April and May. 4 subseries covering species from dwarf to 15 feet.

Ponticum Series: This is a hardy series containing some of the native North American species. *R. Ponticum* is perhaps the best known of rhododendrons with deep mauve flowers and dark, glossy foliage. It is useful for a windbreak or large hedge. Unfortunately it can become a determined competitor with other desirable species. Most are very hardy but often slow growing (3 subseries).



Saluense Series: This is a series of dwarfs with reddish-purple, flat, open flowers and small scaly leaves. Species can be found to cover flowering from April to July.

Scabrifolium Series: With axillary instead of terminal flowers. It is not a widely grown series, since it is not frost hardy. Most are below six feet.

Stamineum Series: A tropical rhododendron. Requires greenhouse care. Fragrant rose flower.

Taliense Series: This series makes excellent foliage plants but are very slow to grow. Sometimes grafted onto vigorous root stocks.

Thomsonii Series: Widely grown, and one of the most important series. Four Subseries. The leaves of this series are usually rounded at both ends. *R. thomsonii* is one of the best known rhododendrons making an open bush or small tree up to about 25 feet. *R. williamsianum* is the only small member of the series, growing up to 3 feet tall.

Trichocladum Series: It is little grown as most are lacking in character. However, *R. lehidostylum* has one of the best foliages of any rhododendron (Cox).

Triflorum Series: The species of this series have an upright character, taking up little space. They have willowy leaves and wide open slightly irregular flowers. Useful for planting in associations. Often divided into colour groups; blues, lavenders and lilacs, the yellows, whites, pinks and magentas.

Uniflorum Series: This is a dwarf series, useful for the rock garden and display borders. As the name implies, mainly single flowers.

Virgatum Series: The two species in this series are often leggy, growing to six feet with axillary tubular-campanulate flowers blooming in April and May. Pinks and whites blooming in April and May.

## CULTURE OF RHODODENDRONS

### PROPAGATION

#### Seed:

Hottes (1928) provides a simple six point outline for the propagation of Rhododendrons from seed:

- (i) sow in early spring or fall in flats
- (ii) use peat moss, leaf mold and sand
- (iii) the seed is very fine and must not be covered except with sand or a little pulverized dry sphagnum moss.
- (iv) water so that water rises from the bottom of the flat - seedlings must never become dry.
- (v) pick off seedlings while very tiny - about 3 months old - into flats of sandy peat - keep at 50 to 55 deg. F.
- (vi) when large enough, plant in frames shaded with lath screens

Despite Clarke's (1967) contention that the gardener will normally secure his plants from a nursery, thus making the subject of propagation relatively unimportant, the simple rules given 50 years ago (above) would seem to be encouragement for any gardener with a thirst for experimentation and a few simple facilities. As Street (1965) rightly points out, seed from hybridized plants will, of course, revert back following Mendel's Law, to the original parents. However, our concern here is with species and not hybrids and Cox (1973) suggests that attention should at least be given to the dwarf rhododendrons for propagation from seed as they can produce flowers within two or three years. Cox, Street (1965) and Edinger (1969) advise self-pollination or hand pollination to ensure a greater degree of uniformity, while Leach (1961) suggests that the progeny can then be selected for cold hardiness, an important consideration for some locations.

Modern plastics have allowed the production of small box-type miniature greenhouses for raising seedlings, but Edinger (1969) suggests a simple clear plastic refrigerator box will suffice, with moist sphagnum moss to ensure initial germination, which will occur in one to three weeks (Cox 1973).

Most rhododendrons are prolific seed producers and the fine seed is (with the exception of Malaysian viable from two to three years (Cox 1973). Although Bartrum (1959) suggests that "rhododendron species are often raised from seeds, nothing could be easier", most authors (Edinger 1969, Cox 1973, Hyams 1965, Leach 1961) warn that sowing density (thin to prevent Botrytis), watering during the period prior to pricking on, initial ventilation and protection from any wide fluctuations in temperature or direct sunlight, can make this stage a most trying experience, with most attempts at raising seedlings failing at this time.

Pricking on is not suggested as complex, though strangely none of the authors mention the possibility of innoculating the growing on flats with mycorrhiza. Rhododendron seedlings do produce root hairs (Cox 1973) but plants grown in natural conditions do not, relying on a mycorrhiza relationship for nutrient absorption.

Notwithstanding the concern voiced by Grant (1943) that if rhododendrons are not propagated by vegetative means "our gardens will be filled with inferior or mediocre plants", it would seem that in the case of species rhododendron, and with a little time and expertise, good quality, hardy plants can be raised and respected.

Until recent changes in commercial practice, grafting understock was almost completely raised from seed and is still used for reproducing wild species. The emphasis on hybrid rhododendrons seems to have muted the interest in growing on from seed; perhaps undeservedly cutting off an interesting opportunity for species development.

#### Layering:

Ground layering is a technique commonly used for producing rhododendrons from mature stock. Edinger (1971) suggests that for the unhurried gardener, not wishing to fuss with propagation devices, layering is the easiest of all methods of reproducing favourite plants. Bartrum (1957) notes that layering is an important method for propagating the larger leaf species which are extremely difficult to strike from cuttings. Especially in Europe, layering has been the preferred method of raising "different" species;

however, the advent of rooting hormones and sophisticated cutting propagation beds may replace this old nursery technique.

For the non-commercial grower, it still has an attraction as it is both free and simple. Two or three year old branches seem to be favoured over older branches (Leach 1961) on the protected side of a mature plant, such that they can be pulled down to ground level, allowing one foot of growth to protrude above the ground when part of the branch is buried in a shallow trench. The old method was just to cover the branch with four to five inches of leaf mold and peg twice, once to hold down and once to force the tip upright. However, this method often produced plants with crooked stems and it is now recommended (Cox 1973, Edinger 1971, and Leach 1961) to make a cut on the under side of the branch, after removing the leaves which would possibly be covered and breaking the stem in order to allow the top of the branch to remain intact, yet have an exposed break facing directly downwards and the branch end directly upright. Leach (1961) suggests that this will cause a concentration of hormones at the wound which will assist in root initiation.

The best time for soil layering is suggested by Bartrum (1957) as March or September while Leach (1961) and Edinger (1971) favour August. Opinions differ as to the length of time layers should be left undisturbed before being severed and planted out for growing on. Leach (1961) suggests that layers found well rooted in the spring, following layering, should be severed but left for a year. Cox (1973) suggests moving after six months, although suggests planting in a shaded nursery spot to establish a good root system. Bartrum (1957) suggests that some layers may take up to three years to establish. Simple inspection as to root development in the leaf mold and condition of the growing bud would seem to simplify the case.

Air layering is touched on briefly by Cox (1973), Edinger (1971) and Leach (1961) although Cox suggests it is not to be tried with dwarf species. No reasons are given. Edinger is rather more enthusiastic, suggesting that it has wider application than soil layering since there are many more branches available. Moreover, it is noted that this technique can be carried out at almost any time on previous year's growth.

The branch is selected and an upright cut, 2" long, is made half way through the

stem, 5" below a good bud. The cut is then dusted with a good rooting hormone, (Hormodin No. 3, Leach 1961) and the cut held open with a small twig. Sphagnum moss is then wetted, squeezed out and wrapped around the cut and held in place with a simple plastic tube made up from a plastic bag bound with waterproof tape top and bottom to exclude moisture entering or leaving the moss.

Leach notes that the technique is an important and reliable method of propagating rhododendrons, yet it is not widely practiced as many early attempts fail for four reasons:

- (i) the plants are not left undisturbed for a long enough period (2 seasons may be required).
- (ii) the sphagnum moss is not squeezed out enough.
- (iii) moisture is allowed to escape from the tube.
- (iv) moisture is allowed to enter the tube.

The general opinion of most authors would seem to endorse the use of air layering and suggest a wider use of this technique.

#### Grafting :

Clarke (1967) discounts the technique of grafting at least for commercial propagation since *R. ponticum* often used for root stock material has a strong tendency to send up suckers which will engulf the scion. Hyams (1965) also suggests that most species do better on their own roots. Cox (1973) is most definite about grafting, noting that it should only be used if all else fails, particularly because *R. ponticum* is highly susceptible to root rots in the high temperatures associated with greenhouses, and to rhododendron wilt which kills the graft. Edginer (1971) discusses grafting only in the context of hybrids but provides useful information on green grafting in the outdoors. Bartrum (1957) is rather scathing about any grafting, concluding a brief discussion of both saddle and side grafting with the comment that neither were methods that he cared for. Leach (1961), although discussing grafting in some depth, is again not enthusiastic about the method; leading one to assume that although it is a viable approach it does not enjoy much favour and is included in most texts only for the sake of completeness.

### Leaf-Bud Cuttings:

Just prior to World War II, considerable research was conducted by Dr. Henry Skinner at Cornell into two types of leaf-bud cutting. A whole healthy leaf with stalk and 3/4" of stem, with resting bud in the leaf axil is cut from a shoot tip of current year's growth, or a sliver of older stem with intact bud may be cut, preferably in September or October, treated with rooting hormone and set out in sharp sand. Hardy varieties may be over-wintered in a cold frame but flats in a greenhouse are probably more successful if given adequate protection from winter sun. Some doubt exists as to the use of IAA, in that rather than promoting growth of roots, its main effect will be to inhibit the lateral bud from breaking (Leach 1961).

In general, however, the method does have some advantages, especially for propagating immature or dwarf plants as it requires only a small amount of wood to produce a number of offspring, unlike true cuttings which are, of necessity, larger.

### Cuttings:

By far the most important and widely utilized method of propagation is from rooted cuttings. The method is not, however, without its problems, and hence detractors. The advent of the mist propagation process with bottom heat and the increasing use of IAA rooting hormone has rectified many of the early failures. Grant (1943) wrote that the difficulty of rooting cuttings increased proportionately with foliage size; that larger leaved species could often be propagated from half-ripened wood. This view is endorsed by Bartrum, (1957), Hyams (1965) and Street (1965). Timing is observed by most authors as crucial to success with Bartrum suggesting a general rule of September, Street suggests as early as the last fortnight in June, while Hyams favours July. Leach (1961) in his very comprehensive volume on the genus, states a clear date for the Pacific North West - 20th September until the end of October. Presumably local site conditions, the particular season, experience and personal preference as to the amount of hardening off acceptable, really dictate the best time

It is generally agreed that early after blooming, an appropriate bud should be removed to encourage lateral growth. By fall, short sturdy cuttings can be made about 3" long.

Lush, leggy growth should be avoided. The cuttings are then cleared of lower leaves and struck in flats for cold frame propagation or in the misting beds. Treatment with rooting hormone (3E) is recommended by most recent authors. Leach favours the cold frame for all but the skilled professional. Otherwise problems of disease, eventual acclimatization and difficulty of maintaining appropriate temperature and humidity conditions may cause high losses. The main disadvantage of cold frame propagation appears only to be one of slow growth rates, a problem of less concern to the non-commercial grower.

Complex rooting mediums have been devised by various authorities and are quoted in the references used for this paper. For ease of preparation and apparent suitability, a 50% peat moss, 50% horticultural perlite would seem to suit. More specific instructions on cutting preparation, inserting cuttings, watering, insects and disease control, removal of rooted cuttings and after care is to be found in most of the more technical references. However Cox (1973) and Leach (1961) give by far the most detailed instructions.

## ESTABLISHMENT

### Styles:

There is a certain mystique as to the appropriate soil type for the genus. As with any plant group as large as the Rhododendron, it is obvious that tolerance of soil condition will have evolved over time. Within somewhat more narrow limits, this is certainly true for most Rhododendrons. They are generally calcifuge but opinions and experience certainly differ in the literature. On the one hand we have Smith (1972) writing that "a cause of infinite regret is that no member of this beautiful genus will tolerate the slightest trace of lime, no matter how disguised with peat", to Platt (1977) discussing the large rhododendron garden on the policies of Lord and Lady Bledisloe, in an article entitled, A Rhododendron Valley on Limestone.

Certainly some of the early collectors found rhododendrons growing on limestone. Both Kinson Ward and Forrest collected plants growing in their natural habitat on bare limestone, Cox (1973). These plants are, however, exceptions to the rule that rhododendrons prefer a pH of 4.5 to 6.0 (Sherk 1968). Work at Edinburgh by

Dr. J. Tod has some species growing successfully in up to pH of 8. For example, *R. ferrugineum* and *R. Hirsutum* seem to be able to withstand this condition, while *R. ponticum* and *R. rubiginosum* are not far behind. Most authors (Street 1965, Hyams 1965, Van Mell 1955, Edinger 1971, Bartrum 1957) settle on a pH of 5.0 as being ideal.

A high organic matter that simulates their natural habitat is also recommended for all rhododendrons. Van Mell suggests as high as 60% to 90%. Bartrum (1957) is less happy with this idea and advises that rotted leaf mulch without some loam is almost as bad as a calcareous soil. His concern is primarily one relating to adequate drainage with an experience of flower bud drop, soft sappy growth and eventual death of plants. Wyman (1974) voices the concern of many growers; what can be done about clay soil? and concludes that ericaceous plants will not tolerate these conditions even with considerable soil amendment, and that digging to a depth of 18", putting in a layer of cinder to stop earth worms bringing the sub soil to the surface, and filling with peaty loam, high in humus content, may provide a solution.

#### Drainage:

In soils with a heavy texture or hardpan, Street (1965) suggests that it is imperative to dig deep to allow for good drainage, although rhododendrons are moisture lovers in both early spring and fall, they will not, for the most part, stand any inundation. Bartrum (1957) sums it up thus, "perfect drainage is essential for all rhododendrons. Even in heavy loam, it must be provided by digging in plenty of coarse sand and gravel". In conjunction with the prerequisites for drainage, Leach (1961) notes the vital importance of friability. The soil must be open, porous, with a loose texture, to allow circulation of air through it. The terminal feeder roots of rhododendrons are so thin and delicate that they cannot grow into compacted soil and often a balled and burlapped plant may still have its root system solely in the original ball if planted in clay.

#### Transplanting:

As with most evergreens, rhododendrons can be transplanted any time when they are not in active growth. In common with most fibrous rooted plants, quite large



specimens can be moved with a high level of success. Leach (1961) observes that for the Pacific North West early autumn should be preferred since the mild humid winters will encourage root formation in preparation for spring growth.

#### Site Selection:

Leach in a short summary at the end of a chapter on site selection, suggests the following:

- (i) acid soil
- (ii) some shade and shelter depending on species and varieties, as well as local climatic conditions
- (iii) appropriate humidity
- (iv) appropriate shade
- (v) appropriate temperatures and protection from frost and winds

The question of shade will, of course, be largely dependent on species tolerance and landscape use. Edinger (1971) points out the importance of determining the latitude and predominant sun angles (the greater the angle the less intense the sun and the greater the exposure of the rhododendrons possible). Wind protection, especially at initial establishment, and choice of exposure are predominant themes in most references. West and north exposures are generally favoured with lath screens the most common suggestion for wind protection. Salt protection is mentioned by Edinger with salt spray winds causing leaf margins and tips to brown, indicating the need for added protection. The question of site selection must, of course, reflect the hardiness of the species in question. Almost all publications provide a system of hardiness ratings.

## MAINTENANCE

### Mulching:

Grant (1943) clearly states the position regarding the use of mulch with rhododendrons: "the delicate fibrous root system of even the hardiest sun-loving species is very close to the surface of the soil and must be protected from exposure to scorching sunlight. This is, of course, particularly true when the plant is young and has not developed a spreading, root-protecting canopy. Grant also notes that keeping the roots run moist is also important in temperature control and advocates the use of coarse leaf mold compost or similar material. Bartrum warns, however, that too liberal use of leaf mold alone may, in heavy soils, cause improper drainage and be too rich, particularly for some of the true species. Again, in the context of mulch as a soil amendment, leaves other than beach and oak are to be frowned upon, although I would have some reservations even about beach as a known calcicole, for it would seem to run the risk, at least with unrotted mulch, to actually introducing leaves of high alkaline content to the site. It is now well known that plants on a particular substrate will concentrate various elements from the soil. In addition, concern with the relationship between mulching, fertilizing and possible attraction of roots to surface feeding is a problem not fully recognized.

A number of authors have provided information on mulches which I have summarized here:

#### Rationale for Use:

- (i) to obtain moisture
- (ii) to modify surface soil temperature
- (iii) to prevent erosion effect of rain
- (iv) to reduce the depth to which frost can penetrate the ground
- (v) to control weeds
- (vi) to provide organic matter and nutrients

Choice of Mulch:

- (i) consider cost
- (ii) consider availability
- (iii) consider appearance
- (iv) consider possible fire hazard
- (v) determine frost insulation capacity
- (vi) determine weed seed content
- (vii) determine acidity
- (viii) consider rodent appeal
- (ix) consider effect on nitrogen availability
- (x) consider effect on drainage

Perhaps it should be remembered that from an ecological standpoint, most rhododendrons are predominantly dappled shade lovers in the forest, probably having natural duff, their own leaf fall and moss growing over their root systems so that a mulch, to some extent, will duplicate this condition. In a combined weed control/mulching effect the use of the herbicide Gramoxone will probably encourage moss growth. Mulching with plastic is, no doubt, effective, but often unsightly and a continuing maintenance problem.

Weed Control:

As mentioned above, the contact type herbicides are suitable for use in plantings - Glyphosate and Paraquate being the two main contenders. Since most rhododendrons are shade-bearing and themselves cast considerable shade when mature, particularly when grown as masses, the problem of weed control should not be insurmountable. No specific references were found for a recommendation for weed control in commercial nursery operations. Cultivation for weed control at any time presumably should be discouraged as rhododendrons are shallow fibrous rooted plants.

Cultivation of Soil:

Street (1965) is the only author that specifically discusses cultivation. Other authors warn against the practice because of shallow root systems. Street, however, does

see some advantages in careful hoeing in order to mix the acid rhododendron leaves into a shallow layer below the surface. On no account should they be raked up and burned as they provide important supplementary mulching and acidification of the soil. Street also notes the undesirability of underplanting rhododendrons with ground covers with the exception of lillies (species not specified), which seem to do well below the mature plants.

### Pruning:

With the exception of those species liable to become leggy and drawn up or where older plants have become too dense or where disease has struck, rhododendrons do not normally require pruning. Wyman (1974) however notes that experimentation has shown that restorative pruning of damaged plantings is possible if done early in the spring with all previous growth cut to within 6 inches above the ground. This is rather drastic and is not advised except in special circumstances. Cox (1973) suggests that plants grown in full sun rarely require any pruning, but shaded plants may require some trimming. Flowering time is suggested as appropriate in order to allow the use of the blooms inside for decoration. Removal of old wood periodically is also advocated. Edinger (1971) and Leach (1961) give detailed accounts on both restorative pruning and maintenance pruning. Edinger reminds that cuts should always be made just above leaf rosettes to allow new growth to emerge. Both authors advocate fall pruning in all but very cold climates. Pruning for standards and espalier is also discussed by Edinger.

Street (1965) argues that the best time to prune is in March, prior to mid-summer growth, cutting back to the yearly growth ring. He further suggests that it is most unwise to prune plants not in good health or growing strongly. It is suggested that freshly planted specimens should not be cut until establishment of two years has occurred. Nine varieties which will not stand pruning are listed. Fertilizer is only suggested as appropriate before pruning, but after that growth has started. Pruning of all sucker growth from root stalks is mentioned only by Street, but it is obviously of great importance with some aggressive grafted under-stalks.

### Disbudding:

In order to limit the number of flowers and thus encourage better size of blooms, disbudding of flower buds is discussed by Street (1965). Removal of growth buds is noted by Hyman as advisable for younger specimen to make them more bushy.

### Flower Head Removal:

Without exception, the authors concerned with general maintenance record the importance of removing flowers after they bloom in order to prevent seed head formation, and to ensure continuous blooming. Several authors note the care with which removal must be accompanied so as not to risk removal of the following year's bud or leaving behind part of the bloom with the later danger of Bud blast. Seabrook (1970) suggests fulling trusses away from the light, which will cause it to break off cleanly and evenly.

### Watering:

Grant (1943) draws attention to the special problems of the Pacific North West which often experiences a dry spell in April and May when the plants need moisture for their new growth. In fact rhododendrons are prone to stunting at this time of year. If this happens, Grant suggests that watering will then be needed from June until fall to make up for early season growth. This, in turn, may lead to second growth and fall frosting. Cox notes that once watering has been started in a drought period, it must be kept up. Neriiflorum and Taliense series are suggested as very susceptible to dry root problems, particularly as they only make one flush per year. Bartrum (1957) points out that in many cases, tap water which is heavily chlorinated and often alkali, should not be used for watering except if it is allowed to stand in sunlight for a few days.

### Fertilizing:

Street (1965) lists cow manure, soot, dry chicken manure, dry guano manure (or liquid), bone meal and super phosphate (small doses at regular intervals) as suitable for rhododendrons. The problem, it is suggested, is rather one of too much fertilizer

than too little, giving plants with lots of growth few flowers. Edinger (1971) warns against the use of fertilizers with N in any form other than ammonium sulphate because of the problem of ph balance and uptake difficulties.

Wyman (1974) quotes H. Ihrig of Puget Sound as having experimented with many combinations and arriving at a recommendation of:

- (i) 10 lbs. sulphate of ammonia
- (ii) 35 lbs. superphosphate
- (iii) 20 lbs. sulphate of potash
- (iv) 20 lbs. cottonseed meal
- (v) 15 lbs. aluminum

This mix is applied to the soil surface above the roots in early spring in small amounts. It is applied again as it is naturally leached out into the roots.

#### Protection from Winter Injury:

As the evergreen rhododendron is constantly transplanting, it may, in cold weather, with high winds, suffer from winter burn. Damage may take a number of forms, depending upon severity and time of occurrence. Leaves may look distorted and rough, curled, or killed outright. In spring, new growth will be killed on leaf tips and edges, while leaf bases and new stems remain undamaged. Edinger (1971) suggests that the frosting of a tender plant in successive years would indicate a definite need to move this specimen or provide physical protection.

Low winter temperature is easily recognized as flower buds turn brown and leaves have watery blisters upon the margin. Actual freezing of the plant can cause massive frost cracking of branches on the main stem. Injury may be obvious with the cracks or bark rolling back, or it may be relatively inconspicuous until the following summer when the whole plant dies.

Direct protection with hessian or solid barriers will help prevent dessication injury but little can be done for a tender plant, say putting it indoors or under glass. It seems more prudent to study with great care the various hardiness ratings developed for the genus and by examining the stalk grown in local nurseries or display gardens.

### Sun Scald:

Both winter and summer sun can cause severe leaf damage. Summer sun will cause brown patches, round in shape, on the edges and tips of leaves, while winter sun scald will cause elongated patches on either side of the mid-veins, especially when the ground is also frozen. Young and newly planted stock appear more susceptible than mature plants. Mulching, greater shade protection and, in summer, aerial misting, can help prevent the occasional problems, but moving inherently susceptible individuals would seem to be the wisest course.

### Chlorosis:

Unavailability of free iron is a common problem for rhododendrons growing in alkaline soils. The characteristic yellowing of the foliage around the veins would indicate the need for treatment. An initial application of chelated iron will give an indication of cause and severity of the problem. If the leaves regain full colour in four to six weeks, the problem is at least diagnosed. It is also possible for a purpling of the foliage to indicate a magnesium deficiency. If an application of magnesium sulphate brings back colour again, it is possible to correct the problem with on-going periodic retreatment. If these remedies do not work and the plant remains discoloured, yet the root system is undamaged, consideration should be given to moving the plant to a new location.

### Insect Pests and Diseases:

Most rhododendrons in cultivation are relatively free of both insect pests and damaging diseases. Oregon, Washington and British Columbia government publications have been consulted and the more commonly occurring insects and diseases are summarized in the following tables. Although honey fungus, *Armellera mellea*, is not mentioned in the table, this disastrous disease has been of great concern in Europe and has been seen to occur on Vancouver Island. Great care should be taken in removal of coniferous stumps and treatment of exposed surfaces soon after cutting, with creosote. The following tables are presented in simple style with the pest, symptoms and present control given in columns. Control measures are noted as present control, since often new

developments or restrictions of some pesticides may change the recommendations from year to year. Consulting the most up-to-date nursery production guides for each province or state appears the most suitable way of determining latest suggestions.

Summary of Insect Pests of Rhododendrons in the Pacific North West

<u>Pest</u>	<u>Symptoms</u>	<u>Present Control</u>
Root Weevil ) Vine Weevil ) Brachyrhilus Strawberry Weevil ) Species Clay Colored Weevil)	Scalloped leaf margins from night feeding of adults. Wilting from grubs feeding on roots. Not all species or individuals affected.	Do not plant with Yew, Hemlock, Euonymus or Hydrangeas, Karmia or Spiraea. Adult bait in clay tile - apple with sodium fluosilicate (grubs-soil drench with Diazinon)
Leaf miner or Rhododendron moth Eucordylea huntella	Small caterpillers, mine in leaves or buds, most noticed when blooms open only partially.	50%W.P. Methoxychlor, cover leaf undersurface thoroughly June 30 & July 15
Centipede Scutigrella immaculata	Feeding on roots causing yellowing or stunting, particularly young plants	Granules of Diazinon ( <u>not</u> very effective)
Rhododendron Lace Bug Stephanitis rhododendri	Whitish stipple on surface of leaf. Worst on plants in direct sun. May cause defoliation.	Move plant to shade or Cygon - May. 3 applications 10 days apart.
Rhododendron White Fly Dialeurodes chittendeni	Yellowish mottle and curling of leaves. Sooty Mould.	Cygon - May. 4 applications starting when seen in May. 10 days apart.
Spider mites, 2 spotted mite. Tetranychus bimaculatus	Mites feeding on under side of leaves causing leaf discoloration or leaf drop in dry summers.	Homeowner - Malathion 50% with spreaker/sticker good penetration to ensure coverage through webbing of mites.



<u>Pest</u>	<u>Symptoms</u>	<u>Present Control</u>
Spider mites (cont'd.)		Commercial- Kelthane 18.5 E.C. Kills only active stages of mite, not eggs. Apply approximately 10 days apart, 3 applications or as required.
Scale - hard and soft scales, most common - Eriococcus sp. cottony scale	Yellow or reddish discoloration of foliage	Superior Oil, dormant season spraying, apply in spring but before buds swell or open. When crawlers emerge in late June, Malathion is appropriate.
Thrips Thrips tobaci	Silver white discoloration of foliage in irregular diffuse blotches.	Methoxychlor with Malathion. Spray combination 15 E.C. and 10 E.C. as necessary. Spray under surface of leaf carefully. Repeat as necessary. Do not treat during bloom.
Thrips (flower) Frankliniella tritici	Collapse of corollas after opening or incomplete opening of buds.	Do not plant near roses or Di-syston. Apply uniformly over soil from trunk to drip line. Work carefully into soil and water thoroughly.

Summary of Diseases of Rhododendrons in the Pacific North West

<u>Organism</u>	<u>Symptoms</u>	<u>Present Control</u>
Leaf Spot ) Cercospora sp.) Septoria sp. ) other sp. )	Purplish black spots or yellow spots with brown centres.	Benlate when attack apparent or pick and destroy infected leaves.
Leaf Rust ) Melompsoropsis sp.) Chrysomyxa sp. )	Infects lower leaves yellow or red or orange pustules on lower leaves.	Do not plant with Hemlock. Do not plant with Spruce.
Leaf gall ) Exobasidium vaccinii)	Malformation of leaves. Leaves become fleshy, thickened and covered in a white bloom of spores.	Avoid overhead watering. Remove and destroy galls as they appear. Pick and destroy infected leaves as they open in the spring. Fermate with spreader/sticker. 4 times at one-week intervals after first galls appear.
Powdery Mildew Microsphaera alni	White sporal coating on leaves.	Benlate or wettable sulphur at ambient temperatures below 80°F. Improve air circulation around plants.
Phytophthora blight. Phytophthora cactorum.	Water soaked appearance of foliage or loss of sheen and leaf drop. Cankers on stem wood, particularly in hot, humid summers. Soil fungus affects fibrous roots then entire root system. Rot continues up through crown to stem.	Do not plant with lilac or dogwoods. Good sanitation on plant, especially removal of seed pods. Use disease free stock. When plants in containers place on coarse well drained beds. Avoid heavy, wet soils. Pruning of infected parts. Cut with sterilized shears. Benelate right after blooming, twice on infected plants.
Rust Chrysomyxa sp.	First appear as yellow spots on upper leaf surface and brown to purple spots on lower surface. Blisters form on lower surface, later rupturing with orange red Bodies.	Actidione spray programme on three week schedule.

<u>Organism</u>	<u>Symptoms</u>	<u>Present Control</u>
Rhododendron Wilt Phytophthora cinnamomi possibly Pythium sp.	Plant wilted in early morning on cloudy days. Olive green cast to leaves. Dark reddish bands below bark at root collar. No feeder roots.	Avoid heavy mulching with sawdust. Ensure drainage or aeration of soil. Burn infected plants - fumigate soil before replanting. Avoid planting near Yew, Chamaceyparis, Ericas or Calluna.
Bud Blast Pycnostyeanus azaleae	Flower buds turn brown and fail to open but remain on plant up to 3 years.	Control leaf hoppers (Malathion) Hand pruning and removal of buds + Benelate or Captan 2 weeks apart summer and fall.
Petal Blight Botrytis Sp.	Dry grey brown mould on weakened or aging flowers.	Thylate or Benelate on flowers at first sign of infection. Continue summer and fall as required. Decrease shade and improve air circulation.
Honey Fungus Armillaria mellea	Rhizomorphs in upper soil layers and infection of roots and lower stem. Death of plants.	Avoid planting with lawson cypress, western red cedar, grand fir, Japanese larch and western hemlock. Avoid sites with known Honey Fungus infection. Avoid sites with infected hardwoods or damaged butts of trees or untreated conifer stumps. Armillatox at 1/16.

## LANDSCAPING WITH RHODODENDRONS

In searching the extensive literature for information for landscaping with Rhododendrons it becomes quickly evident that despite voluminous books, with ample illustration, few publications adequately provide simple guidelines on the use of Rhododendrons in the landscape. Moreover, there are few simple separations of the species Rhododendron from the hybrids, and few, if any individual summaries of plant characteristics appropriately linked to landscape use. Perhaps a market exists for a simple card index on the attributes, care and use of individual Rhododendrons for both the home owner and the professional.

The Rhododendron is a superb landscaping shrub. There are types suitable for foundation planting, for background, mid-section and foreground and shrub borders, underplantings under such specimen trees as our Western Dogwood. They are ideal for the edges of woodland and can, in fact, be continued throughout wooded areas where they thrive in the high cool shade from such trees as pine and oak. There are many dwarf Rhododendrons, suitable for rock gardens and rock walls. Rhododendrons can also make a formal garden more formal, or an informal setting more enchanting. Van Veen (1969) notes how little used Rhododendrons are in public areas, around businesses and industrial structures. Properly sited and established, surely the Rhododendron has a place in the industrial landscaping. As the density of living increases and the access to individual garden space decreases, there is still no reason why we should forego the beauty and enjoyment of these magnificent plants. Fortunately, the Pacific West Coast is well endowed with botanical gardens and arboreta open to the general public. The number are given in Appendix I.

International travel now allows the dedicated and enthusiastic or earnest professional to see Rhododendrons in most parts of the world. A few of the more important gardens are given in Appendix II.

The landscape designer, amateur or professional, has a magnificent pallet of characteristics with which to work. In fact, few genera can compete with the Rhododendron. Flower size and colour, blooming time and length of flowering period,

leaf shape, colour and texture, along with fragrance of flower and leaf, allow a plethora of opportunities above and beyond the varieties of size and scale. The hybrids notwithstanding, the species Rhododendrons, from the delicate miniature alpine to the rain forest giant, are worthy of greater use and respect.

This section cannot attempt to cover individual plants in detail, however it can portray the opportunities with a few examples.

### Specimens:

These are perhaps best selected for brilliance of colour and unique form. This use serves to emphasize and articulate their form, directing the eye from focal point to focal point. Care should be exercised to retain the elements of scale and propriety.

### Specie Selections:

*R. augustinii* - grows to 15 feet. Free-flowering in late April and early May with lillac blue flowers in an elegant triflorum shape.

*R. wardii* - grows 8 to 12 feet. Leaves are round to oblong and are glossy, dark green above and whitish below. Loose trussed yellow flowers appear in early May.

*R. bureavii* - grows up to 8 feet. Leatherly leaves with a bright, rusty-orange woolly indumentum underneath on older growth, faun on new growth. White to pale rose flowers in compact trusses in early April.

*R. yakusimanum* - rarely grows above 4 feet. Flowers are globose trusses in creams and pinks.

### Mass Planting:

Although mass planting has often been overdone, it must have a place in the landscape

of large places and a natural display garden. Because of the size and density of *Rhododendron* foliage, care must be taken to select good flowering species, bright flowers, with larger groupings providing a uniformity of colour and texture. Size, scale and viewing point are important considerations. Planting selections:

*R. fictolacteum* - a West Coast selection, growing up to 25 feet tall. Oval leaves up to 12 inches long, dark shining green with a pale buff indumentum below. Large truss of 20 to 30 flowers, varying from white to rose colour.

*R. lutescens* - grows up to 15 feet. One of the most beautiful of the early spring bloomers, sending out bright yellow flowers between January and April. New growth is bronze, later turning reddish-brown.

*R. augustinii* - a slightly different approach to group planting using a blue species. 10 to 12 feet tall. Has sharply pointed leaf buds and thin textured lanceolate leaves, 3" long. Flowers are carried three in a truss, appearing late April or early May, as a blue lilac.

*R. smirnowii* - grows up to 8 feet. A good, dense wind-resistant foliage plant. Useful for forming an inner barrier at ground level. The rose-pink blooms appear in late May.

*R. williamsianum* - a smaller yet exceptional *Rhododendron* growing to 4 feet. Foliage is smooth, mostly leathery to the feel, leaves may be almost rounded to oval in shape. A late April bloomer with a largely pink flower.

*R. wardii* - a variable plant growing from four to 12 feet tall. Beautiful large flowers, yellow to creamy yellow in May and June.

*R. impeditum* - grows to 18 inches. Free flowering, neat, compact plant. Leaves are small, scaly on both surfaces, grey-green when young and blue-green when mature. Flowers are mauve to purplish blue in late April and early May.

*R. sargentianum* – grows up to 12". Compact and slow growing with lemon-yellow to white flowers in terminal clusters. Early May. Dark green leaves are aromatic.

#### Planting in Association:

Many trees, bushes, shrubs and ground cover plants can be grown in association with Rhododendrons (Krussman 1970). Trees are an important association plant since they reflect the habitat type most common to Rhododendrons in the wild. Types of tree compatible with Rhododendrons are those with dense, compact grounds, or wide thin grounds, allowing filtered sunlight and providing some protection from frost and winter winds. Trees with surface feeding roots should be avoided as they will deprive the Rhododendrons of nourishment. Most pines and firs are suitable, *Tsuga* varieties, *Thuja*, *Cryptomeria*, larch, oak, many *Sorbus*, and *Ginkgo* are all examples which are generally compatible, with interesting characteristics which contrast with but do not detract from the Rhododendrons. Most, if not all, of these species are also appropriate for the acid soil conditions needed by the Rhododendrons. To this list are added the distinctive leaves and bark of some of the maples, *Acer palmatum*, *A. griseum* and *A. nikoense* (Berrisford 1964). In addition, mention should be made of magnolias, *Cercidiphyllum japonicum*, *Juniperus coxii* and *J. sabina tamariscifolia* and *Chamaecyparis pisifera filifera*.

The essence of combination planting of Rhododendrons with various shrubs must surely be to compliment not compete. Leaves of different shapes, stature and habit and contrast of flowering periods which do not conflict, would seem important. The various kinds of *Forsythia*, *Cornus kousa*, *Photinia villosa*, *Hamamelis* and upright *Cotoneasters* should be considered. Krussman (1970) makes mention of *Halesia carolina* and varieties of *Ilex*, while Berrisford (1964) notes *Pieris forrestii*, *Embothrium coccineum* and *Hydranga* as appropriate. The latter would have to appeal to a specific taste as the contrast would be considerable if not even inappropriate. Of the smaller shrubs *Gaultheria*, *Ericas*, *Corylopsis*, the more compact *Cytisus* and some of the *Berberis* would seem obvious choices.

Among the ground cover plants, *Pachysandra terminalis*, *Hypericum calycinum* and

members of the fern family would appear appropriate. La Croix (1973) is particularly endeared by the Primula and Meconopsis, particularly *M. betonuiifolia* and *P. pulverulenta* with crimson flowers and *P. japonica* with apricot flowers. Of the bulbs little is known but it would seem that dwarf Narcissus, Crocus and for the later season Agapanthus would have a place.

To conclude, mention should be made of the ornamental grasses, ferns and bamboo. *Arundinaria*, *Polystichum*, *Avena sempervirens*, and *Phyllitis scolopendrium* would be examples worthy of note and might provide visual contrast yet textural compatibility with many *Rhododendron* species.

Interplanting, with other plant species, provides relief and contrast from the often sombre *Rhododendron* when not flowering. Selection of *Rhododendrons* for companion planting should be based on those which display abundant flowers, but retain an open growth habit and sparse foliage. Planting selections:

*Rauriculatum* - grows to 15 feet. Sparsely foliated plant that has a surprisingly long season of bloom. The heavily scented flowers are white and up to 4" across.

*R. lacteum* - grows up to 10 feet. Blossoms are a brilliant yellow, in large globular trusses. Flowers appear in early to late May.

*R. virgatum* - grows up to 6 feet. A leggy plant with pink or white blossoms in April or May.

*R. fastigiatum* - grows up to 3 feet. This stiff but straggly upright shrub has mauve or purple flowers in late April or early May.

#### Rhododendrons in Containers:

Of all the references consulted, no author ventures into the area of containerizing *Rhododendrons*. Concern may exist for providing adequate shade and protection from drying winds. In addition, adequate provision of water, at appropriate times, may preclude extensive use of this plant in such a manner.



### Rhododendrons in the Garden:

Rhododendrons can form a framework for the shrub garden. When they are in flower, they give a mass effect rivalled by few other plants and by careful choice of variety, the flowering season can be prolonged at least to August (*R. auriculatum*). When out of flower, their mostly evergreen character can be enhanced by careful choice of Rhododendrons with interesting leaf colour and texture. See Appendix III.

The tall species of Rhododendrons are ideal for the back of the border, where they themselves are likely to have some shelter from a fence, hedge or wall. If adequate shelter is available, even in a small garden, a tree Rhododendron can provide a superb foil for a small garden pond, which in turn provides adequate humidity for these larger leaf varieties (for example *R. fictolacteum*). As there is now a resurgence of interest in the garden border, thought should be given to tailoring appropriate Rhododendrons for the centre of the border, where those with neat rounded, compact habits can contrast pleasantly with the tall varieties (as an example *R. neriiflorum*).

There is no excuse for ignoring the dwarf species of Rhododendrons, both for front planting of larger beds and, of course, for the rock garden. Much work has been done in developing appropriate species and hybrid dwarf varieties by the Cox's in Scotland. (in the 18" to 2 feet category, the purple *R. fastigiat* and in the true dwarf category, the scarlet crimson *R. forrestii*, are extravagant examples. See also selections in Appendices III and IV.

### Rhododendrons in Woodlands:

Most, but not all Rhododendrons are woodland dwellers where the soil texture and content is appropriate to their needs. A natural woodland offers woodland shelter and a branch canopy to act as a blanket and to protect the plants from frost and burning sun. All but the smallest leaved Rhododendrons appreciate such a situation and even the dwarfs will grow well at the edge of woodlands.

Where existing woodland is to be converted for *Rhododendron* planting, it requires careful preparation. Judicious thinning is important. Excellent examples can be seen at the U.B.C. botanical garden forthcoming Asian display. Adequate provision must be made to provide growing space since many *Rhododendrons* can grow quite rapidly once naturally established. Care must be taken in the thinning and removal process, particularly in conifer woodlands to ensure that old stumps are appropriately treated to prevent invasion of honey fungus, which can rapidly cripple a woodland *Rhododendron* display. Use of herbicides, particularly those with any residual, should be avoided since the *Rhododendrons* with their fibrous root system and connection with the family *Ericaceae* makes them particularly susceptible to chemical damage. A sometimes overlooked problem, with clearing in woodland areas, is the propensity to burn brush for disposal. The bonfire ash, containing calcium and potassium, can quite easily produce a magnesium deficiency in both *Rhododendrons* and *Azaleas*.

Species in the *Arboreum*, *Falconeri*, *Fortunei*, *Thomsonii* and the *Triflorum* series all provide magnificent plants for the woodland setting. *Ponticum*, despite its naturalization in woodland, should be treated with care since it can become incurably invasive once established.

#### Rhododendrons for Frangrance:

All too often the colour, bloom, leaf texture or stature of *Rhododendrons* is exaulted to the detriment of other attributes. One aspect of personal interest is frangrance in plants. Though the species of *Rhododendron* are not amply blessed with frangrant types, Neill (1968) lists *R.moupinense*, a white to rose blooming plant with faint scent, *R.bullatum* - a white, scented species, *R.fortunei* with fragrant pink lilac blooms, and *R.glaucophyllum*, with aromatic leaves. Wilder (1974) mentions the *Rhododendrons*, *falconeri* with sweet scent, *griffitianum* with a light honey scent, *houlstonii* with a rich spice scent, *decorum* with a light spice scent and *wilsoni* with a faint honey scent.

## References:

- American Rhododendron Society, 1968. Rhododendron Notebook, Oregon Press  
180 pages.
- Bartrum, D., 1957. Rhododendrons and Magnolias, John Gifford Ltd., London,  
176 pages.
- Bunt, W., 1957. Garden Shrubs and Their Histories, Charles, p.268-279.
- Berrisford, J., 1964. Rhododendrons and Azaleas, Faber and Faber, 284 pages.
- Clarke, J.H., 1967. The Fundamentals of Rhododendron and Azalea Culture.  
Quarterly Bulletin, American Rhododendron Society, 21:1,  
29-37.
- Cook, C., 1973. Making Friends with Flowering Shrubs, Simon and Schuster,  
New York, 86-88.
- Cook, E.T., 1902. Trees and Shrubs for English Gardens. Country Life, 412-417.
- Cox, P.A., 1973. Dwarf Rhododendrons. Royal Horticultural Society and Batsford  
Books, 269 pages.
- Edinger, P., 1971. Rhododendrons and Azaleas. Sunset Books, 80 pages.
- Grant, J.A. et al, 1943. The Trees and Shrubs for Pacific Northwest Gardens,  
Pacific Books, 198-216.
- Goser, R., 1971. Multi-Season Shrubs and Trees, Faber and Faber, 122-142.
- Haworth-Booth, M. 1962. Effective Flowering Shrubs. Collins, 347 pages.
- Haye, R. et al, 1975. McCullough Dictionary of Flowering Plants for Home and  
Garden. Royal Horticultural Society and Crown Publishers.  
536-537.
- Hyams, E, 1965. Ornamental Shrubs for Temperate Zone Gardens. Vol. I,  
MacDonald, 82-108.
- Hofman, J. et al, 1969. Ornamental Shrubs. Spring Books, 82-96.
- Hottes, A.C., 1928. The Book of Shrubs. at De La Mare, 280-285.
- Kindon-Ward, R., 1949. Rhododendrons. Latimer House, 123 pages.
- Krussmann, G., 1970. Rhododendrons. Ward Lock Ltd., London. 96 pages.
- Leach, D.G., 1961. Rhododendrons of the World and How to Grow Them.  
Scribner, 543 pages.
- Neill, J. 1968. In Scherk, Ornamental Shrubs for Canada. Canada Department of  
Agriculture, Publication 1286. 129-130.

- Pirone, P.P., 1960. Diseases and Pests of Ornamental Plants, Ronald Press, 604-617.
- Platt, J., 1977. The Rhododendron Valley on Limestone - The Garden, 102 Cronin Hall. 150-153.
- Royal Horticultural Society, 1967. Rhododendron Handbook, Part I, Rhododendron Species in Cultivation. 281 pages.
- Seabrook, P., 1970. Shrubs for your Garden. Scribners. 112-113.
- Sherk, L.C., 1968. Ornamental Shrubs for Canada, Canada Department of Agriculture. Publication 1286. 124-126.
- Stevenson, J.B., 1930. The Species of Rhododendron. The Rhododendron Society, 863 pages.
- Smith, G., 1922. Shrubs and Small Trees for your Garden. Collingbridge, 148-150.
- Street, F., 1965. Rhododendrons, Cassel. 177 pages.
- Wyman, D., 1974. Shrubs and Vines for American Gardens. MacMillan. 612 pages.
- Van Melle, P.J., 1955. Trees and Shrubs for the Small Place. The Garden Guild. 76-87.
- Van Veen, T., 1969. Rhododendrons in America. Sweeney, Krist and Dimm, 176 pages.
- Wilder, L.B., 1932. Re-Issued 1974. The Fragrant Garden. 128-129.