Plant Evaluation Notes

Performance Appraisal of Selected Small-leaved Rhododendrons

Richard G. Hawke, Coordinator of Plant Evaluation Programs

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Rhododendrons and azaleas are often regarded as either non-hardy or possessing such restrictive environmental requirements that cultivation in the upper Midwest is considered strictly for the avid gardener and plant connoisseur. However, many species and cultivars are grown in the plant collections of regional botanical gardens and arboreta, and in home landscapes throughout the area. In most instances the success of these collections depends upon the careful selection of the planting site including soil modifications and barriers against sun and wind.

A widely accepted rhododendron for planting in the Chicago area (USDA Hardiness Zone 5a-b) is the hybrid cultivar 'PJM' derived from *Rhododendron carolinianum* and *R. dauricum* var. *sempervirens*. The evergreen habit, reliable spring bloom, and overall hardiness of 'PJM' are characteristics sought by gardeners in this harsh climate, and its success in the local landscape is due to its adaptability to adverse sites and its ability to thrive in full sun. Its bright lavender-pink flowers are a welcome sight after a long Midwestern winter. No other rhododendron fills the local landscape niche for broadleaved evergreens better than 'PJM'.

Rhododendron 'Laurie'

Five Year Performance Evaluation

In 1985 the Chicago Botanic Garden initiated a five year project to evaluate the performance of a select group of small-leaved, evergreen rhododendrons (see Table 2) that are similar in nature and/or related to *Rhododendron* 'PJM', and therefore, exhibit many of the same characteristics and cultural traits.[1] These hybrids, generally referred to as lepidotes,[2] were developed and introduced by the late Edmund V. Mezitt, Weston Nurseries, Hopkinton, Massachusetts, with the exception of 'Windbeam' (*R. minus* var. *minus* × *R. racemosum*) which was introduced by G. Guy Nearing (Salley and Greer 1986). Four goals were established for the project:

1) to determine cultural adaptability
2) to expand the flower color range

[1] The Weston hybrids, 'Olga Mezitt' and 'Aglo' were not included in this evaluation group, but also merit attention. These hybrids are currently being sold and planted in the Chicago area with much success and acclaim.

[2] Lepidote (scaly) refers to the minute disc-like scales on branchlets, leaves and flowers. Lepidotes and elepidotes (non-scaly) are the two standardly recognized *Rhododendron* divisions (Davidian 1982).

3) to extend the bloom period
4) to increase public awareness of the successful varieties.

The plants held great promise for use in full sun and in less than ideal soil conditions, including a higher soil pH. The test site was protected on three sides by a five foot high board-on-board fence, and sheltered by a grove of conifers approximately 20 feet to the south.[3] During the summer the site was in full sun approximately 12 hours, but large trees in the vicinity provided shade to the site's perimeter in early morning and late afternoon. The site received an average of six hours of winter sun each day. The soil was completely replaced with a mixture of 10% shredded leaves, 40% topsoil, and 50% rotted horse manure. Five inches of peat moss were worked into the top ten inches of this mix. Initial soil tests revealed a pH of 7.3. To counteract the high pH (8.0) of the irrigation water, granular sulfur (88 pounds of 90% at 4 pounds per 100 square feet) was applied to the surface of the test site in August 1988. Subsequent soil tests in the summer of 1989 revealed a slight decrease of the pH to 7.1. This was the lowest pH recorded at any time during the evaluation term.

Typical maintenance involved supplemental irrigation when necessary, removal of dead or crossed branches, and seasonal mulching. No additional fertilizer was applied to the plants during the evaluation period. No insect or disease damage was noted during the evaluation term. Deer browsing was periodically evident, but occurred randomly and no variety sustained injury every year. The flower bud hardiness rating noted in Table 2 refers to the temperature at which the flower buds were killed in laboratory testing at the University of Minnesota Landscape Arboretum. It must be noted that reliable test results depend upon whether or not plants have been acclimated through normal winter temperature drops and not sudden, sharp decreases in temperature (Pellett et al. 1986). Flower bud survival averaged 75-90% over the five year period and several varieties sustained no losses. Late frosts periodically damaged open flowers on the earliest blooming varieties. Several varieties were more vigorous in growth than others, but none performed poorly. Vegetative dieback due to low winter temperatures was negligible or non-existent. The cultivars 'Laurie' and 'Pink Clusters' had high vegetative injury ratings in 1988 due to excessive deer damage. See Table 1 for information regarding climate and rainfall during the evaluation period.

The foliage of these rhododendrons, with the exception of 'Pink Clusters', is small, leathery and medium to dark green throughout the growing season. Mixed autumnal tones of red, orange, burgundy and yellow may be present on the same plant during the fall months. Actual retention of leaves through winter varies but the burgundy colored leaves are most dominant and persistent (see Table 2). The percent retention of foliage throughout the winter months was consistent for each variety during the testing period. In certain years fall color was good, but it was not dependable or generally of good quality. Fall color, as noted in the chart, refers to basic coloration and potential; actual intensity or quality is dependent upon site location.

Conclusions

After five years of evaluation, all varieties can be recommended for use in the Chicago area and areas of similar climatic and edaphic conditions. Slight modification of the planting site is recommended to improve drainage and to increase organic content of the soil. The higher pH range (7.0-7.3) did not appear to adversely affect the performance or

Table 1: Weather Summary for 1985 - 1990

	1985	1986	1987	1988	1989	1990
Lowest temp. - °F	- 26	- 6	- 5	- 13	- 15	- 6
Highest temp. - °F	95	95	97	103	100	98
# days above 90°F	9	10	22	43	7	11
# days below 0°F	20	5	3	16	12	1
Last frost date	4/10	5/03	4/09	5/14	5/07	5/31
Annual precipitation[a]	43.3	43.1	39.4	30.4	28.2	48.8
Annual snowfall[b]	34.3	23.4	31.7	26.0	25.8	23.0

[a]Average rainfall 33.35 inches
[b]Average snowfall 39.8 inches
Data obtained from the Chicago Botanic Garden weather station.
Latitude: 41°51'N. Longitude: 87°37'W. Altitude: 176.4m (578.74ft.)

[3] Three test sites were initially developed to grow and evaluate the plants under varying cultural conditions, including different soil modifications, soil pH, slope and degrees of protection from the sun. The plants performed well in each of these environments for two growing seasons. No significant differences were noted among the three evaluation groups during this brief period. Renovation of the test garden in 1987 required moving all plants into a holding area for 3 months. Following renovation the original test sites were eliminated and all the plants were transplanted into a single area for the remaining three years of evaluation.

Table 2: Performance Summary for 1988 - 1990

Cultivar	Flower Bud Hardiness[1]	Vegetative/ Floral Injury[2]	Habit[3]	Bloom Period	Flower Color	Autumn Foliage Color	Winter Foliage Retention
'Balta'	-18°F	0/0%	broad	late April/May (8-10 days)	white	bronze	5%
'Evergreen Pink Hybrid'	n/a	10/10%	rounded	mid May/June (6-21 days)	deep pink	purple	50%
'Laurie'	-24°F	0/10%	rounded	late April/May (14-18 days)	lt. pink to white	green	90-100%
'Lienroc'	-18°F	0/0%	rounded	late April/May (4-21 days)	light pink	green	25%
'Milestone'	-13°F	0/0%	rounded	mid-late April (14-21 days)	deep pink	red/purple	25-50%
'Molly Fordham'	-18°F	0/0%	rounded	late April/May (14-21 days)	white	red	80-100%
'Pink Clusters'	-13°F	5/5%[4]	low, spreading	May (14 days)	pink	burgundy	90%
'Vallya'	-18°F	0/0%	upright, oval	late April/May (10-20 days)	pink	yellow to red	40-50%
'Weston's Pink Diamond'	-18°F	0/0%	wide, upright	mid-late April (14 days)	pink	red/green	50-75%
'Windbeam'	-34°F	0/0%	rounded	early-mid May (14-21 days)	pink	red/burgundy	90%

[1]Measure of the killing temperature of flower buds. Test results obtained by the Minnesota Landscape Arboretum.
[2]Average percentage of winter vegetative and floral damage observed.
[3]All plants averaged 9-10 years old at the project's termination.
[4]In 1988 only, flower bud loss was 65-80%.

health of the plants during the evaluation period. All varieties were grown in, and are well adapted to full sun. The successful cultivation of these small-leaved rhododendrons expands the flower color range, extends the bloom period, and provides an increased variety of plant characteristics and forms (see Table 2).

The availability of these varieties in the Chicago area is limited. A survey of the local nursery and garden center industry revealed only three sources currently selling any of these varieties. If you know of a Chicago or Midwest source please contact the Chicago Botanic Garden Plant Evaluation Department so that this information may be made available.

Top Five Performers

After assessing each variety on various characteristics such as bloom quality, quantity, and reliability; plant vigor; foliage; and development, the five top performers were: 'Milestone', 'Weston's Pink Diamond', 'Molly Fordham', 'Laurie', and 'Pink Clusters', in order of standing.

- ***Rhododendron* 'Milestone'**

This variety, formerly named 'Marathon', is a second generation cross of *R. dauricum* var. *sempervirens* and *R. minus* var. *compactum* (Weston Nurseries 1989). 'Milestone' was the most robust variety overall, and exhibited outstanding floral quantity and quality. The plants averaged 116.4 cm (46 in.) tall and 91.0 cm (36 in.) wide in 1990, representing an approximate doubling in size from 1985. No winter injury was observed except for late frost damage to flower and buds in 1986 and 1988. Slight stem tip damage from deer browsing was recorded in 1988. Fall color is typically a fair mixture of red and purple.

- ***Rhododendron* 'Weston's Pink Diamond'**

This is a cross of *R.* 'PJM' and *R. mucronulatum* 'Cornell Pink' (Salley and Greer 1986). Plants averaged 83.3 cm (33 in.) tall and 89 cm (35 in.) wide in 1990, representing an almost dou-

bling in size during the evaluation period. Flower coverage was typically 80-100%. Flowers and buds were damaged by late frosts in 1986 and 1988. Stem tip damage from deer browsing was recorded in 1988. Fall color is red but approximately 75% of the leaves remain green or take on a slight bronze tinge.

- ***Rhododendron* 'Molly Fordham'**

This is a cross of *Rhododendron* 'Balta' and *R. carolinianum* var. *album* (Weston Nurseries 1989). The plants averaged approximately 5 cm of growth per season, and were 61 cm (24 in.) tall in 1990. 'Molly Fordham' had the most compact habit of all the varieties. There was slight winter injury to branch tips in 1988. Fall color can be red, but the majority of the leaves remain green over winter.

- ***Rhododendron* 'Laurie'**

This hybrid is a cross between *R.* 'PJM' and *R. carolinianum* var. *album* (Salley and Greer 1986), and is a sibling of *R.* 'Balta'. Slow growing, the plants added 2.5 cm of new growth per season, averaging 48.3 cm (19 in.) tall and 53.4 cm (21 in.) wide in 1990. Flower coverage was typically good at 80-90%, but poor in 1988 due to winter dieback and deer browsing. Fall color is purple, but the majority of the leaves remain green over winter.

Rhododendron 'Milestone'

- ***Rhododendron* 'Pink Clusters'**

'Pink Clusters' is a fourth generation *R. kiusianum* hybrid (Weston Nurseries 1989). Unlike the other plants in the test group, this plant is a low, spreading semi-evergreen azalea. Plant height averaged 40.6 cm (16 in.) tall and 71.2 cm (28 in.) wide in 1990. Flower quality and quantity were good with the exception of 1988 when severe winter injury removed most of the buds. Each year the plants sustained a small amount of tip damage, which affected flower buds, but bloom remained reliable. The majority of foliage is held over winter and can take on an excellent burgundy color in a good year.

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