

Plant Evaluation Notes

Clematis for Northern Landscapes

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You have decided to plant a clematis in your garden, but which clematis will you choose? The myriad of flower colors and forms—from the reds, purples and blues of the large-flowered cultivars to the small, waxy yellow Oriental species to the prolific starry-white blossoms of virgin's bower or sweet autumn clematis—will astound you. Your selection will surely be influenced by your ornamental expectation, and should be appropriate for your site and design, but it will most certainly be determined by which clematis you can purchase. Although clematis is commonly available to gardeners in some form, not all markets share the wealth of clematis that exists. Garden centers and mail-order nurseries are carrying more and more clematis from which you can choose. But choosing wisely may not be that simple.

Clematis, pronounced klem'e-tis, is a genus in the buttercup family (Ranunculaceae) that contains over 300 species native to the northern and southern hemispheres, and although few of the species are commonly cultivated, many man-made hybrids are found in the nursery trade. Numerous common names

exist, including virgin's bower, old man's beard, leather flower and vase vine, although most of these refer to a particular species rather than the genus as a whole. The generic name *Clematis* is most often used as the common name.

Clematis are mainly woody, climbing plants, but there are herbaceous and nonclimbing species as well. Clematis do not climb by tendrils or aerial roots, but instead climb by gently twining their leaf petioles around nearby supports, including plant stems, branches, wires, small poles and itself. Clematis do not cling to walls and without support will ramble until they find something suitable to climb on. In the wild, clematis are often found growing at the woods' edge, where their tops can reach full sun and their roots remain in the shade.

An extraordinary diversity of flower colors, sizes and forms occurs in the genus *Clematis*. Colors range from shades and blends of blue and red to yellow and white. Flowers can be less than one inch across to over six inches wide, and are urn-, bell-, star- or tubular-shaped. An interesting floral trait of clematis is the presence of colorful, showy sepals and inconspicuous or absent petals. Only in some

Clematis alpina and *C. macropetala* are true petals present (Lloyd 1989). Sepals masquerading as petals, sometimes referred to as tepals, vary from four to eight per clematis flower. Flower color develops as the buds fully open, and sometimes in cooler weather the tepals open green and color-up as the blossom ages (Evison 1991). In some species the seed heads are feathery, silver puffballs that cover the plant later in the season and account for the common name old man's beard.

Selecting the right place for clematis in the garden is an important consideration for successful cultivation. Clematis requires a cool, moist soil for optimum growth. Planting clematis with its crown protected by the shade of a shrub or tree will provide a cool root zone, as well as mask the potential bareness of the lower stems. Underplanting with a groundcover or perennial will also shade the roots. Do not plant clematis where it will have to compete for water, such as too close to a large tree trunk, in the drier area near a wall or next to a building with overhanging eaves. Adequate moisture is important and will ensure a healthy plant. Clematis can be planted deep and actually benefits from having the crown buried about four inches below the surface of the soil. This practice can assist with regeneration of stems from dormant buds below the soil if the top of the plant is damaged by animals, wilt or mechanical injury.

Clematis are commonly placed in three categories based on bloom times, flowering habits and pruning requirements (see sidebar, page 2). There are a number of diseases and pests that can affect clematis in the landscape, with clematis wilt being a major and sometimes debilitating disease (see sidebar, page 5). Earwigs, rabbits, mice and slugs can also cause damage.

Clematis are effective in a formal or informal landscape, in a natural setting or in a container on the patio. Plants can be grown in the traditional manner as a focal specimen clambering on a wall, fence, trellis or lamp post, or simply allowed to ramble in, over and through other plants. Climbers provide the vertical dimension in small garden spaces while the herbaceous species are wonderful additions to



Tom Clark

Clematis 'Ville de Lyon' in the Pullman Plant Evaluation Garden at the Chicago Botanic Garden

Pruning Requirements

Pruning clematis can seem a most daunting exercise, but it does not have to be so. Clematis are routinely placed in three categories to simplify the pruning process. Group I includes clematis that flower on short stalks arising directly from a leaf axil bud, on stems produced the previous growing season, and therefore should not be pruned until after flowering is finished in the spring (Evison 1991). New stems produced after pruning will eventually produce the flower buds for the following spring. Pruning need only occur if space is limited or to remove dead and weak stems. Severe pruning late in the season will affect the next year's crop of flowers. Group I includes the earliest-flowering species such as *C. alpina*, *C. macropetala* and *C. montana*.

Clematis that produce their first flowers typically before mid-June on stems from the previous season's wood belong in Group II. Pruning should be completed in late winter or early spring when buds begin to swell but stems have not yet started to grow. Prune out any weak and dead stems, and cut back remaining stems to a pair of strong, healthy buds. How far back you cut the stems will be determined by your use. This group will often flower on new wood again in late summer or fall. Group II includes the early and mid-season, large-flowered hybrids like 'Bees Jubilee', 'Nelly Moser' and 'Vyvyan Pennell'.

Group III clematis produce flowers on new stems each year, and each stem typically bears multiple blossoms. Stems produced in the previous season usually die during the winter and must be removed before new growth begins in the spring. Stems may live through a mild winter, but plants will become leggy and overgrown if not cut back regularly. As with Group II, pruning for these plants should be completed in late winter or early spring. Prune the old growth to a pair of healthy, strong buds near the base of the plant. Hard pruning will encourage new shoots from the crown. Clematis in this group include the late-flowering, large-flowered cultivars, *C. viticella*, *C. texensis* and the herbaceous species.

Stems should be tied into place immediately following pruning. Some degree of labor is involved in training clematis onto a structure or into a large plant. Many clematis grow so quickly in the spring that daily attention to training is helpful. Initial care in training will reward you with a better display. Plastic-coated wire or mesh will support the clematis on a wall or fence. Clematis need to reach a horizontal or vertical support about every six inches. Gaps of greater distance are acceptable if plants are aided in climbing during the early season.

the perennial border. Weakly climbing or non-climbing species like *C. × durandii* are perfect for rambling through the garden. Many clematis species and cultivars can also be used as cut flowers.

With few demands on the gardener, clematis will reward you with an abundance of beautiful blossoms. Combining multiple flower colors or overlapping bloom periods will prolong the beauty and elegance of clematis throughout the season. To see a clematis in full bloom is to understand why it is often called the queen of flowering vines.

Evaluation Project

Clematis have been cultivated for centuries, but their popularity as a garden plant dates from the latter half of the nineteenth century when many hybrids were being developed. The British have long grown and hybridized clematis, and in recent years many new hybrids have been introduced from Poland and Japan. Clematis growing high into treetops and covering arbors and fences are familiar sights in warm climate zones. But what about clematis in the Midwest? Indeed, we can and do grow clematis in the Midwest, and we're growing more species and cultivars all the time. The Chicago Botanic Garden undertook an evaluation project to determine which clematis were suitable for cultivation in USDA hardiness zone 5b.

The clematis evaluation project was initiated in the spring of 1990 and continued through the fall of 1995. The goals were to: (1) compare the ornamental characteristics of commercially available species and cultivars; (2) determine the cultural parameters necessary for successful cultivation; and (3) promote the cultivation or use of clematis in northern landscapes. Sixty-four species and cultivars were included in the project (Table 1); all but a few were generously donated by Mr. Raymond J. Evison of The Guernsey Clematis Nursery Limited, Channel Islands, England. Some of the herbaceous species were obtained during a plant exploration trip to the Republic of Korea or were gifts from other botanical institutions.

The clematis were planted in four types of sites, providing north-, south-, east- and west-facing exposures. The sites were fairly similar in character with the exception of the specific exposure. Soils were a clay loam with shredded leaves and wood chips added; no additional soil amendments were made at the time of planting. Soils were well-drained in each location with an average pH of 7.4 during the evaluation term. Climbing plants were grown on wooden fences, ranging from five to seven feet tall. The configuration of the fence system and the companion plantings created a variety of

microclimates within the garden. A minimum of three plants of each taxon were evaluated.

Maintenance practices were kept to a minimum to simulate home garden culture. The plants were not fertilized after planting and received supplemental irrigation as needed. A mulch of shredded leaves and wood chips was maintained for aesthetics, water conservation, weed control and cooling of the root zone. Emerging shoots were tied to plastic coated wires that were affixed horizontally to the fence at intervals of 12 inches. The natural fiber raffia was used to tie the stems to the wires until the leaf petioles could cling naturally.

To protect against rabbit damage, each climbing plant was surrounded by a wire mesh cage, 12 to 18 inches tall. Plants were given a preventative treatment for clematis wilt when planted in 1990 and again in 1995. The treatment consisted of a foliar/stem spray and soil drench of Benlate at a rate of one pound per 100 gallons of water. All clematis, except the earliest-flowering species, were pruned each year in late winter to remove dead stems, improve plant vigor and maintain growth within the evaluation space. Stems were typically cut to within two feet of the ground, but the pruning of each plant was considered individually, based on its health and vigor. Early-flowering species were pruned only to remove dead or damaged stems and to aid in training.

Observations

The various exposures within the test garden created a challenge when observing the clematis plants and analyzing data collected during the trial. Many of the clematis were grown in multiple sites with different exposures. In general, the three plants of a taxon grew similarly in each location, with some exceptions noted. Site exposures for the recommended clematis are noted in Table 2. Plants were positioned for optimum exposure to sunlight, but in several instances clematis plants became too shaded or crowded by companion plants, which ultimately affected the growth and health of those clematis.

During the evaluation period, information was collected on flower color, size, bloom period and overall coverage; plant height and form; disease and pest resistance; plant health; winter hardiness; and cultural adaptability. Sixty of the original 64 taxa completed the six-year project. A summary rating was assigned to each taxon based on its overall performance and health (Table 1). The 33 clematis that are recommended for northern landscapes are cited in Table 2, with a check mark signifying superior performances. Taxa that received fair to poor ratings are not included in the table as

Table 1: *Clematis* Evaluation Group and Summary Ratings

★	<i>aethusifolia</i>
★★	<i>alpina</i> ‘Constance’
★★★	<i>alpina</i> ‘Pamela Jackman’
★★	<i>alpina</i> ‘Willy’
★★	‘Asao’
★★★	‘Ascotiensis’
★★★	‘Barbara Jackman’
★★★★	‘Bees Jubilee’
★★★	‘Bill Mackenzie’
★	<i>campaniflora</i>
★★★★	‘Comtesse de Bouchaud’
★★★	‘Countess of Lovelace’
★★★	<i>x cylindrica</i>
★★	‘Duchess of Edinburgh’
★	‘Duchess of Sutherland’
★★★★	<i>x durandii</i>
★★★	‘Elsa Späth’
★★★	‘Ernest Markham’
★★	‘Etoile de Malicorne’
★★	‘Fair Rosamond’
★	<i>florida</i> ‘Alba Plena’
★	<i>florida</i> ‘Sieboldii’
★★	<i>fremontii</i>
★	‘Gillian Blades’
★★★	‘Gipsy Queen’
★★	<i>glauca</i> var. <i>akebioides</i>
★★★	‘Guernsey Cream’
★★★	‘Hagley Hybrid’
★★	‘Henryi’
★★★★	<i>x jouniana</i> ‘Praecox’
★	‘King Edward VII’
★★	<i>koreana</i>
★★★	‘Lady Betty Balfour’
★★	‘Lasurstern’
★★	‘Lilacina Floribunda’
★★★★	<i>macropetala</i>
★★★	‘Marie Boisselot’
★★★	‘Madame Baron Veillard’
★★	<i>montana</i> ‘Grandiflora’
★★★	‘Mrs. Cholmondeley’
★★★	‘Mrs. P.B. Truax’
★★★	‘Nelly Moser’
★★★	‘Pagoda’
★★★	‘Perle d’Azur’
★★	<i>pitcheri</i>
★★★	<i>recta</i>
★	‘Richard Pennell’
★★★	‘Rouge Cardinal’
★★★	<i>serratifolia</i>
★★	<i>texensis</i> ‘Duchess of Albany’
★★	<i>texensis</i> ‘Gravetye Beauty’
★★	<i>texensis</i> ‘Sir Trevor Lawrence’
★★★	‘The President’
★★★	<i>tibetana</i>
★★	<i>trichotoma</i>
★★★★	‘Ville de Lyon’
★★	<i>viticella</i> ‘Alba Luxurians’
★★★★	<i>viticella</i> ‘Etoile Violette’
★★★★	<i>viticella</i> ‘Grandiflora Sanguinea’
★★	<i>viticella</i> ‘Little Nell’
★★	<i>viticella</i> ‘Polish Spirit’
★★	<i>viticella</i> ‘Purpurea Plena Elegans’
★★★★	‘Vyvyan Pennell’
★★	‘William Kennett’

Summary Performance Ratings:

★★★★ Excellent, ★★★ Good, ★★ Fair, ★ Poor

they are generally not recommended. A discussion of plant health, diseases, pests and winter hardiness follows the general observations.

Observations are based on how a plant grew in a specific site and may not be exact for the same plant grown under different conditions. Nearly all of the taxa had one or more plants growing in a south-facing position, although sixteen taxa had no representative plants in a southern exposure, including *C. alpina* ‘Willy’, ‘Ascotiensis’, *C. fremontii*, ‘Gillian Blades’, ‘Gipsy Queen’, *C. koreana*, ‘Lasurstern’, ‘Lilacina Floribunda’, ‘Perle d’Azur’, *C. recta*, ‘Rouge Cardinal’, *C. trichotoma*, *C. viticella* ‘Alba Luxurians’, *C. viticella* ‘Etoile Violette’, *C. viticella* ‘Grandiflora Sanguinea’ and *C. viticella* ‘Polish Spirit’. Of these, *C. alpina* ‘Willy’, ‘Gillian Blades’, ‘Lasurstern’ and ‘Lilacina Floribunda’ grew weakly in the other exposures.

Nine taxa received superior ratings for heavy flower production, high quality blossoms, exceptional ornamental characteristics, vigorous habits, winter hardiness and disease and pest resistance (Table 2). These plants were also rated highly because plant health and vigor increased each season.

The large-flowered hybrids—‘Bees Jubilee’, ‘Comtesse de Bouchaud’, ‘Ville de Lyon’ and ‘Vyvyan Pennell’—had exceptional floral displays. Flower coverage was consistently high at 80% to 100% with peak coverage lasting for over six weeks. Individual blossoms typically remained ornamental for 9 to 11 days. *Clematis* × *durandii* topped the list for duration of ornamental effect of individual flowers with an average of 17 days.¹

With the exception of the bushy habit of ‘Bees Jubilee’, most of these clematis were vigorous climbers. Some plants grew so quickly that assiduous attention to training was crucial each spring. When left unattended, plants mounded on themselves, resulting in inferior forms. *Clematis* ‘Ville de Lyon’, *C. viticella* ‘Etoile Violette’ and *C. viticella* ‘Grandiflora Sanguinea’ were typically bare at the base, to about three feet. *Clematis* × *durandii* was a nonclimbing hybrid best left to clamber along the ground. When treated like a vine and tied to the fence, its 12-inch-long internodes made an open display. The mounded habit and rambling stems of *C. x jouniana* ‘Praecox’ worked well cascading over a retaining wall. Although not a climber, it made a passable display when tied up to the fence.

Twenty-four taxa received high ratings for flower production, blossom quality, ornamen-

tal traits, vigorous habits, winter hardiness and disease and pest resistance (Table 2). Some characteristics may have been stronger or weaker in a particular year, but the overall display was consistently good.

Flower coverage was usually noted in the 60% to 80% range, although coverage was recorded as high as 100%. Heavy flower production was not always enough to overcome a lesser trait. ‘Perle d’Azur’ had consistently high flower coverage, but its habit was rather loose and leggy. *Clematis serratifolia* was one of the most vigorous and floriferous species, but brown leaves were typically observed throughout the plant and concentrated on the lower portion of the stems. Its habit and growth rate were rampant and weedy, spreading by seeds and rhizomes.

For sheer beauty of blossom, seven taxa were outstanding, including ‘Ascotiensis’, ‘Ernest Markham’, ‘Guernsey Cream’, ‘Lady Betty Balfour’, ‘Marie Boisselot’, ‘Perle d’Azur’ and ‘Rouge Cardinal’. In fact, these flowers were among the most significantly decorative of the entire evaluation project. Clear white sepals and white stamens gave ‘Marie Boisselot’ a clean appearance; it was the best white-flowered cultivar in the trial. The bright blue flowers of ‘Ascotiensis’ were vibrant, especially in the cool shade of morning; unfortunately, the brown, spent flowers sometimes

¹Only *Clematis florida* ‘Alba Plena’ surpassed this mark with flowers lasting an average of 31 days, and with one flower remaining ornamental for 62 days in 1994.

hung onto the plants. The velvety crimson blossoms of 'Rouge Cardinal' were among the most beautiful of all.

Color was just one of the floral characteristics noted. All plants of 'Hagley Hybrid' were grown in full sun, which faded out the delicate pink flowers. Its crinkled, crepe paper-like blossoms were particularly attractive on cloudy days or in low light. 'Mrs. P.B. Truax' held its flowers in a tier above the foliage, thus displaying the blossoms in a more distinct manner. Flower production was usually high for *C. tibetana*, but in some years its full potential was not realized because the late-season flowers were killed by frost.

The plant vigor, health and habits of taxa in this group were also typically good with a few exceptions observed. Dead stems were sometimes an aesthetic problem on the early-flowering *C. alpina* 'Pamela Jackman'. Since these plants were not cut back each spring, greater attention to cleanup was required later in the season or the plants became messy. The short stems of *Clematis* × *cylindrica* twined together and only weakly climbed up the fence. 'Guernsey Cream' was an early-flowering Group II hybrid that produced abundant blossoms on old wood. 'Lady Betty Balfour' was so vigorous that it quickly outgrew the evaluation space and required extra support at the top

of the fence to hold its heavy mass.

Under half of the evaluation group received fair to poor ratings due to one or more of the following reasons: low flower production, inferior habit, decreased plant vigor and health, foliar problems and diseases. Clematis that received fair ratings included *C. alpina* 'Constance', *C. alpina* 'Willy', 'Asao', 'Duchess of Edinburgh', 'Etoile de Malicorne', 'Fair Rosamond', *C. fremontii*, *C. glauca* var. *akebioides*, 'Henryi', *C. koreana*, 'Lasurstern', 'Lilacina Floribunda', *C. montana* 'Grandiflora', *C. pitcheri*, *C. texensis* 'Duchess of Albany', *C. texensis* 'Gravetye Beauty', *C. texensis* 'Sir Trevor Lawrence', *C. trichotoma*, *C. viticella* 'Alba Luxurians', *C. viticella* 'Little Nell', *C. viticella* 'Polish Spirit', *C. viticella* 'Purpurea Plena Elegans' and 'William Kennett'.

Aside from disease and other health problems, the most notable reasons that plants received fair ratings were low flower production and inferior plant habits. The clematis taxa that rated low in flower production, less than 40% coverage, were 'Etoile de Malicorne', 'Fair Rosamond', *C. fremontii*, 'Henryi', *C. koreana*, *C. montana* 'Grandiflora', *C. texensis* 'Duchess of Albany', *C. texensis* 'Gravetye Beauty', *C. trichotoma* and *C. viticella* 'Polish Spirit'. Flower coverage on *C. viticella*

'Polish Spirit' was 100% in 1991 but only reached 40% in subsequent years. This dramatic decline in flower production put 'Polish Spirit' behind some of the other *C. viticella* cultivars even though it sustained a healthy and vigorous habit. Clematis with flower coverage of 40% to 60% but with weak or inferior plant habits were 'Asao', *C. glauca* var. *akebioides*, 'Lilacina Floribunda', *C. viticella* 'Alba Luxurians' and *C. viticella* 'Purpurea Plena Elegans'. And the clematis that exhibited both low flower production and inferior habits were *C. alpina* 'Willy', 'Lasurstern', *C. pitcheri*, *C. texensis* 'Sir Trevor Lawrence' and *C. viticella* 'Little Nell'.

Several taxa that received fair ratings also exhibited inferior floral quality. 'Duchess of Edinburgh' and *C. viticella* 'Alba Luxurians' both had white flowers with a green, leafy character. Sepals were often distorted and puckered at the margins and hung onto the plants after turning brown. The lavender-blue flowers of 'William Kennett' were often washed-out and lost among the foliage. *Clematis trichotoma* was a vigorous plant that never flowered.

Fair-rated plants are not usually recommended, but there were a few that showed potential for increased vigor and health if grown in a different setting or given more cultural care.

Table 2: Recommended Clematis for Northern Landscapes

Clematis	Flower Color/Character	Flower Size	Bloom Period ¹	Flower Coverage	Plant Height ²	Exposure ³	Pruning Groups	Comments
<i>alpina</i> 'Pamela Jackman'	deep blue	8.9 cm (3 1/2 in)	early May-late May, Aug-Sep	80%	>1.5 m (5 ft)	■	1	fruit ornamental from July to September
<i>Ascotensis</i>	bright blue	11.4-14.0 cm (4 1/2-5 1/2 in)	late Jun-late Aug, Sep-Oct	50-80%	>1.8 m (6 ft)	■	3	old flowers hang on brown; wilt to 50% in 1993-95
<i>Barbara Jackman</i>	lavender; strong violet bar	12.7-15.2 cm (5-6 in)	early Jun-early Jul, Aug-Oct	60-80%	>1.8 m (6 ft)	■	2	not a strong climber; dark green leaves
<i>Bees Jubilee</i>	mauve-pink; darker bar	14.0-15.2 cm (5 1/2-6 in)	late May-late June, Jul-Aug	60-100%	<1.8 m (6 ft)	■	2	not a strong climber; flowers can hang on brown
<i>Bill Mackenzie</i>	soft/lur yellow	3.8 cm (1 1/2 in)	mid July-Oct	80-100%	>6.6 m (5 ft)	□	3	vigorous climber; one of the best fruit displays
<i>Comtesse de Boucheud</i>	mauve-pink	11.4 cm (4 1/2 in)	mid Jun-late Aug, Sep-Oct	80-100%	>2.4 m (8 ft)	■	3	rarely injured overwinter; wilt noted in 1993-95
Countess of Lovelace	lilac-blue; ruffled edges	14.0 cm (5 1/2 in)	early Jun-late Jul, Aug	60-80%	>1.8 m (6 ft)	■	2	good climber; wilt noted at 25% to 50% in 1995
<i>cylindrica</i>	purplish-blue; recurving tepals	2.5-5.1 cm (1-2 in)	mid Jun-early Jul, Aug-Sep	80%	>0.9 m (3 ft)	□	3	not a strong climber; twines upon itself
<i>x dirandii</i>	indigo-blue	12.7 cm (5 in)	mid Jun-late Jul, Aug-Sep	60-80%	1.5 m (5 ft)	■	3	nonclimber; long-lasting flowers; wilt 1994-95
'Elsa Späth'	blue	14.0-15.2 cm (5 1/2-6 in)	early Jun-mid Aug	60-80%	>1.8 m (6 ft)	■	2	good climber; chlorosis; minor wilt noted 1994-95
'Ernest Markham'	magenta	11.4 cm (4 1/2 in)	mid Jun-late Aug	80-100%	>2.1 m (7 ft)	□	3	vigorous climber; strong climber
'Gipsy Queen'	purple	12.7 cm (5 in)	mid Jun-early Aug, Sep-Oct	50-80%	>1.8 m (6 ft)	■	3	vigorous climber; minor chlorosis noted in 1994
Guernsey Cream	creamy-yellow	11.4-12.7 cm (4 1/2-5 in)	late May-mid Jun, Sep	80%	>1.5 m (5 ft)	□	2	do not cut back until after flowering for best results
'Hagley Hybrid'	pink; crepe paper look	10.1-15.2 cm (4-6 in)	mid Jun-early Aug, Sep	60-80%	>2.4 m (8 ft)	■	3	flowers fade in sun; minor wilt; chlorosis 1994-95
<i>x jouniana</i> 'Praecox'	white and bluish; clustered	3.8 cm (1 1/2 in)	early Jul-early Sep	60-100%	1.2 m (4 ft)	■	3	nonclimber; leaves hold brown over winter
'Lady Betty Balfour'	dark purple	10.1-12.7 cm (4-5 in)	mid Jul-late Sep	60-90%	>2.4 m (8 ft)	□	3	vigorous climber; wilt; anthracnose noted in 1994
<i>macropetala</i>	lavender	3.2-3.8 cm (1 1/2-1 1/2 in)	early May-early Jun, Jul-Aug	80-100%	>1.5 m (5 ft)	■	1	good climber; short-lived flowers 4 days only
'Marie Bousseot'	white	15.2-17.8 cm (6-7 in)	early Jun-late Jul, Aug-Sep	60-80%	>2.4 m (8 ft)	□	2	best white clematis tested; minor wilt in 1993, 1995
'Madame Baron Veillard'	rosy-lilac; slightly cupped	11.4-12.7 cm (4 1/2-5 in)	mid Jul-mid Aug	60-80%	>1.8 m (6 ft)	■	3	vigorous climber; chlorosis noted in 1995
<i>Mrs. Cholmondeley</i>	lavender-blue	12.7 cm (5 in)	early Jun-late Jul, Aug-Sep	60-80%	>1.5 m (5 ft)	□	2	not a strong climber; chlorosis noted each year
<i>Mrs. PB. Truax</i>	lavender-blue	14.0 cm (5 1/2 in)	late May-late Jun, Aug	60-80%	>2.4 m (8 ft)	■	2	good climber; flowers held away from plant
<i>Nelly Moser</i>	pale mauve; carmine bar	15.2 cm (6 in)	late May-early Jul, Sep	60-80%	>2.1 m (7 ft)	■	2	good climber; minor chlorosis in 1994; wilt in 1995
'Pagoda'	pale purple; nodding	3.2 cm (1 1/4 in)	mid Jun-Aug, Sep	60%	>2.1 m (7 ft)	■	3	purple stems
'Perle d'Azur'	blue	10.2 cm (4 in)	late Jun-late Jul, Sep-Oct	60-100%	>2.4 m (8 ft)	■	3	vigorous plant; long internodes; bare stems at base
<i>reca</i>	white; stamry	2.5 cm (1 in)	late May-early Aug	60-80%	0.9 m (3 ft)	■	3	herbaceous; blue-green leaves; rabbit damage
'Rouge Cardinal'	dark red	11.4-12.7 cm (4 1/2-5 in)	early Jun-late Jul, Aug-Sep	60-80%	>1.8 m (6 ft)	■	3	compact; not a strong climber; minor chlorosis
<i>serratifolia</i>	yellow; nodding	3.2 cm (1 1/4 in)	mid Aug-mid Sep	80-100%	>2.1 m (7 ft)	□	3	potentially weedy; spreads by seed and rhizomes
<i>The President</i>	rich purple	14.0 cm (5 1/2 in)	early Jun-late Jul, Aug-Sep	60-80%	>1.8 m (6 ft)	■	2	purple stems; anthracnose noted in 1992 and 1994
<i>tiberiana</i>	yellow; bell-shaped	3.2 cm (1 1/4 in)	late Sep-Oct (frost)	60-80%	>2.7 m (9 ft)	■	3	glaucous leaves; flowers often killed by frost
'Ville de Lyon'	bright crimson red	10.2-12.7 cm (4-5 in)	late May-late Jul, Sep-Oct	80-100%	>2.1 m (7 ft)	■	3	vigorous climber; minor chlorosis noted each year
<i>viticella</i> 'Etoile Violette'	violet-purple	8.9-10.2 cm (3 1/2-4 in)	mid Jun-late Aug, Sep	80-100%	>2.4 m (8 ft)	■	3	vigorous and prolificous; stems bare at base
<i>viticella</i> 'Grandiflora Sauguinea'	deep magenta	8.9 cm (3 1/2 in)	late Jun-mid Aug, Sep-Oct	80-100%	>3.7 m (12 ft)	■	3	stems burgundy; increased in vigor each year
'Wyvan Pennell'	lavender-blue; double/single	16.5-17.8 cm (6 1/2-7 in)	late May-Aug, Sep-Oct	60-100%	>2.1 m (7 ft)	■	2	vigorous plants; minor wilt noted in 1991

¹ Superior performance

² Remonant or repeat bloom period is noted after the comma. Remonant is defined as a nonflowering period of at least two weeks following the primary bloom period.

³ Height range noted as greater than (>) or less than (<). Size based on existing evaluation location with the potential for growing larger if given more space.

¹ Refers to the general performance of a plant or plants in a north, south, east and west exposure, respectively. Good performance in a specific exposure denoted by ■, a lesser performance in a specific exposure denoted by □. **Boldface denotes taxa with ornamental fruit.**

Clematis Wilt

by Andra Windorf Nus, former research assistant. Current address: Plant Recorder, Longwood Gardens, P.O. Box 501, Kennett Square, PA 19348.

Wilt is a confusing problem affecting clematis. Conclusive research on the cause of clematis wilt is unavailable, and little is known about the relative success of recommended prevention and control methods.

Jim Fisk, a respected clematis expert, believes that clematis wilt "is not a disease at all but a failure of the very thin stem to cope with a sudden demand for moisture from the stem leaves and flowers," resulting "in a breakdown of the tissues at a certain spot." Other experts, however, agree that the symptoms are probably caused by a fungus, but which fungus it might be is also debated. *Ascochyta clematidina*, the most commonly accepted cause, has been identified both in the United States and Great Britain. Another fungus, *Coniothyrium clematidisrectae*, has been identified in Holland as a possible cause of wilt, and Barry Fretwell in his book *Clematis* notes that "it is fairly widespread, and whether this, or a combination of the two (fungi), is to blame we have yet to find out."

Clematis wilt is most damaging during the early growing season, when the plants are in bud or flower. Leaf spot and/or partial stem rot occurs, and the vine wilts and withers because moisture does not reach the growing tips. This can happen slowly or quickly, to one stem or to the entire plant. Fungicides have been used as a preventative; however, once the plant has been infected, the only recommended control is to prune out affected stems below the infection point.

It appears most probable that clematis wilt is caused by a fungus that attacks the vine, causes brown leaf spotting and/or stem rotting, whereupon the vine wilts for lack of water. Experts do seem to agree that clematis wilt is usually not fatal, and most plants will resprout from below the infected point – some even after three years of being presumed dead.

Clematis that ranked between fair and good included *C. fremontii*, *C. texensis* 'Duchess of Albany', *C. texensis* 'Sir Trevor Lawrence', *C. trichotoma*, *C. viticella* 'Alba Luxurians', *C. viticella* 'Little Nell' and *C. viticella* 'Purpurea Plena Elegans'.

Only eight clematis performed so poorly that no recommendation can be given. In each case, ornamental quality was so diminished and/or disease problems too severe for the plants to be successfully grown. Clematis that declined steadily in plant health and received the lowest ratings were *C. aethusifolia*, 'Duchess of Sutherland', 'Gillian Blades', 'King Edward VII' and 'Richard Pennell'. All

plants of *C. campaniflora*, *C. florida* 'Alba Plena' and *C. florida* 'Sieboldii' died from lack of winter hardiness.

Plant Health, Diseases and Pests and Winter Hardiness

Plant health, affected by disease and cultural conditions, varied among plants in the collection. In some cases, the decline in health was progressive over the course of the evaluation term, and in other instances, plant health declined quickly in one season. A variety of health issues, diseases and pests afflicted the clematis collection, but many plants were unaffected or recovered from injury.

Nutrient deficiency expressed as interveinal chlorosis was not a significant ornamental or health problem for the majority of clematis. Chlorosis on individual plants was observed in some years, yet was absent or inconsequential in other years. It was, however, a significant health concern and a limiting factor to the ornamental quality of all plants of 'Asao', 'Duchess of Edinburgh', 'Duchess of Sutherland', 'Gillian Blades', 'King Edward VII' and 'Lasurstern'. Chlorosis was less severe but observed on 'Elsa Späth', 'Fair Rosamond', 'Gipsy Queen', 'Hagley Hybrid', 'Henryi', 'Madame Baron Veillard', 'Mrs. Cholmondeley', 'Nelly Moser', 'Rouge Cardinal', *C. trichotoma* and 'William Kennett'.

Plants that had inferior health, vigor or reduced flower production due to competition or shade were 'Duchess of Sutherland', *C. fremontii*, *C. koreana*, *C. viticella* 'Alba Luxurians', *C. viticella* 'Little Nell' and *C. viticella* 'Purpurea Plena Elegans'. *Clematis fremontii* in particular was healthy with moderate growth, but was planted in too much shade to produce abundant flowers. Clematis plants that were never strong or healthy included 'Lasurstern', 'Lilacina Floribunda' and *C. pitcheri*. These plants did not gain vigor after planting and remained loose and spindly in habit.

A few diseases and pests were observed, with varying degrees of injury noted from clematis wilt and anthracnose to earwigs and rabbits. Clematis wilt was the most serious disease problem and was indicated by the decline of leaves and stems above the point of infection, usually near the base of the plant. Stems withered and died, either slowly or rapidly. Symptoms were usually observed from early June onward, as the large-flowered clematis were beginning to bloom (see sidebar, left).

Wilt was first observed in 1992 on one plant each of 'Duchess of Sutherland', 'Etoile de Malicorne' and *C. texensis* 'Gravetye Beauty'. Occurrences of wilt in subsequent years were sporadic and varied in degree of injury, with no significant infection noted until



Richard Hawke

Clematis 'Bees Jubilee'

1994. At that time the following clematis were infected with wilt at low levels: 'Ascotiensis', 'Countess of Lovelace', *C. × cylindrica*, *C. × durandii*, 'Elsa Späth', 'Ernest Markham', 'Hagley Hybrid', 'King Edward VII', 'Lady Betty Balfour', 'Marie Boisselot', 'Madame Baron Veillard', 'Nelly Moser', *C. texensis* 'Duchess of Albany', *C. texensis* 'Gravetye Beauty' and 'William Kennett'. Wilt rarely killed more than 25% of a plant's stems at any time, with most plants recovering fully from the infection. But one plant each of the following clematis was greatly weakened by wilt over the course of the trial: 'Comtesse de Bouchaud', 'Duchess of Edinburgh', 'Duchess of Sutherland', 'Etoile de Malicorne', 'Henryi', 'Madame Baron Veillard', 'Perle d'Azur' and *C. texensis* 'Gravetye Beauty'. Only four plants died following repetitive years of severe injury from clematis wilt – one plant of 'Duchess of Sutherland' and three plants of 'Henryi'.

Anthracnose was first observed in the clematis collection in early August of 1993 and was confirmed by the University of Illinois Plant Clinic, Urbana, Illinois. Symptoms of the disease, caused by the fungus *Glomerella cingulata*, were necrotic spotting of leaf margins, stem blight and leaf drop, typically observed in the fall. Anthracnose was evident again in 1994 and 1995 on clematis. There was no exclusive cultural condition, exposure or site-type in which anthracnose was observed. It affected healthy plants, as well as weak or unhealthy plants. Although the severity of infection varied, no plants were killed. Taxa with one or more plants affected by anthracnose included 'Bees Jubilee', 'Comtesse de Bouchaud', 'Duchess of Edinburgh', *C. × durandii*, 'Elsa Späth', 'Etoile de Malicorne', 'Fair Rosamond', 'Hagley Hybrid', 'King Edward VII', 'Lady Betty Balfour', 'Mrs. P.B. Truax', 'Perle d'Azur',



Richard Hawke

Clematis 'Lady Betty Balfour'

Richard Hawke

Clematis 'Guernsey Cream'

Tom Clark

Clematis × *durandii*

C. serratifolia, *C. texensis* 'Duchess of Albany', *C. texensis* 'Sir Trevor Lawrence', 'The President', 'Ville de Lyon', *C. viticella* 'Alba Luxurians', *C. viticella* 'Etoile Violette', *C. viticella* 'Grandiflora Sanguinea', *C. viticella* 'Little Nell', *C. viticella* 'Purpurea Plena Elegans' and 'William Kennett'.

Damage from insects and animals was less notable than injury from wilt and anthracnose. Earwigs were an aesthetic nuisance only. This nocturnal insect chewed holes in flower buds and along the edges of tepals, sometimes leaving the flowers tattered. Damage was observed in most years but varied in degree of severity. Mainly large-flowered varieties growing in a southern exposure were damaged. Injury from rabbits was insignificant because of the protective mesh cages surrounding most plants. The stems of *Clematis recta* were not protected, and consequently these plants incurred some damage. Feeding injury was also noted on a few other plants where the mesh cage was less than 15 inches tall.

Stem dieback due to winter injury was not considered important unless notably severe, since most clematis were routinely cut back each spring to control size and to remove dead stems. Stem hardiness varied among taxa and with each year, and no consistent injury was observed on any of the taxa. Plants that were weakened by winter injury in the first two years and never returned to full health included *C. aethusifolia*, *C. glauca* var. *akebioides* and *C. pitcheri*. The stems of *C. montana* 'Grandiflora' were typically killed to the base of the plant over winter. Flowering was low and sporadic

because of the loss of the older stems, but the new growth was always vigorous, exceeding eight feet in a season. Clematis that did not complete the full six-year evaluation term due to winter injury included all plants of *C. campaniflora*, *C. florida* 'Alba Plena', *C. florida* 'Sieboldii' and 'Richard Pennell'. Both cultivars of *Clematis florida* survived two winters but were greatly weakened and eventually died in the third growing season.

Conclusions

Clematis are good choices for northern landscapes. With attention to cultural conditions, site placement and plant selection, you will be rewarded with exceptional floral displays. Over half the clematis evaluated completed the project with good to excellent ratings. Exceptional plant vigor, health and floral characteristics were notable attributes that set this group apart from the remainder of the test collection.

Exposure did not appear to be a critical factor for most clematis, but the best results were seen in south-facing positions. The majority of clematis had at least one plant facing south, and most of these plants were healthy, vigorous and floriferous, gaining in stature each season. Providing shade for the base of the plant helped moderate the soil temperature and retain the necessary soil moisture. Too much competition limited the growth of some plants, but most clematis mixed well with their companions and usually held their own in the garden.

Clematis wilt and anthracnose were observed at various levels, and except in a few cases, were not devastating. Clematis wilt can

be a frustrating disease because it strikes just as the plant begins to bloom, but it is rarely fatal and plants generally regenerate quickly. At this time sulfur is the only product labeled for the treatment of clematis wilt, and removal of diseased plant parts is an important practice in the control of wilt. There is no chemical labeled for the treatment of anthracnose, so sanitation is the best prevention here. Pests were insignificant overall, and rabbits proved only a minor nuisance that were effectively controlled by placing wire mesh cages around the base of the plants.

Be creative with clematis. Take advantage of the many flower forms and colors by combining more than one clematis for interesting effects and a prolonged bloom display. Remember that there is a clematis for just about any situation, whether to cover an arbor, climb a pole or ramble through the garden border. Choose wisely, and be rewarded with extravagant blossoms for many years. 🌸

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