

Wisteria frutescens, American Wisteria, 'Betty Matthews' First Editions[®] Summer Cascade[™]

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The Woody Landscape Plant Breeding and Genetics Program (WLPBGP) at the University of Minnesota was initiated in 1954 with the express purpose of developing new, cold-hardy woody landscape plants for Minnesota and the surrounding environs. Such plants are selected to be capable of surviving winter cold events in U.S. Department of Agriculture (USDA) Plant Hardiness Zone 4 (–20 to –30 °F; –28.9 to –34.4 °C) landscapes (U.S. Department of Agriculture, Agricultural Research Service, 2012). Although the program has released over 50 cold-hardy woody landscape plants in that time, no vining plants have been released from the program. Relatively few choices exist regarding flowering vines for USDA Zone 4 landscapes, largely relegated to *Clematis*, *Lonicera*, and *Campsis* cultivars. Several hardy *Wisteria* cultivars, derived from American wisteria (*Wisteria frutescens*), are described; however, not all are reliably USDA Zone 4-hardy. We describe a hardy American wisteria cultivar, *Wisteria frutescens*, American wisteria, 'Betty Matthews' First Editions[®] Summer Cascade[™], the first ornamental vine released by the WLPBGP.

Origin

American wisteria (*Wisteria frutescens*) is a North American relative of the more well-known Asian species of wisteria, Japanese wisteria [*Wisteria floribunda* (Willd.) DC.] and

Chinese wisteria [*Wisteria sinensis* (Sims) DC.]. *Wisteria frutescens* formerly referred to the southern variant of a species complex occurring from Virginia in the East to eastern Texas in the West. The northern variant, Kentucky wisteria, was referred to as *W. macrostachya* (Torr. & A. Gray) Nutt. ex B.L. Rob. & Fernald, and occurred from southern Missouri and Illinois to eastern Kentucky in the north (Dirr, 2009). The two variants have now been joined as one species, American wisteria, with the botanical epithet, *Wisteria frutescens* (Integrated Taxonomic Information System, 2013). Populations of American wisteria have been reported to naturalize in more northerly locations including extreme southern Michigan and New York (U.S. Department of Agriculture, Natural Resources Conservation Service, 2013).

American wisteria naturally occurs in moist woodlands, wetland borders, pond and stream-sides, and wet thickets. Although it flowers prolifically in sunny locations, it performs well, albeit with reduced flowering, in partial to full shade locations. The species prefers a slightly acidic moist, loamy soil, but will thrive in a wide range of soil types ranging between pH 6.1 and 7.5 (Hightshoe, 1988). Various accounts of the species and forms cite the mature size as ranging between 4.6 and 12.2 m (15 to 40 feet). Such variation can likely be accounted for by the favorability of the growing site, length of the growing season, and genetic variation. American wisteria is a twining vine that grows up by twining counterclockwise around a support. It is not as vigorous or as prone to suckering as its Asiatic relatives, which makes it more manageable in the garden.

Compared with the Asian species, American wisteria flowers later in the season (late May to early June in the Twin Cities region of Minnesota), which generally protects its flowers from late-season frosts. Individual flowers open acropetally, beginning at the basal end of the inflorescence and progressing to the distal end. The bloom period typically lasts several weeks. Although American wisteria has

lightly fragrant flowers, it is considerably less fragrant than its highly fragrant Asian relatives. The species flowers primarily on old wood. American wisteria produces inflorescences in a raceme structure that varies from a 7.6- to 10.2-cm (3 to 4 inches) rounded raceme on the southern forms to longer, 20.3- to 30.5-cm (8 to 12 inches) tapering racemes, comprising 70 to 90 flowers on the northern forms (Cullina, 2002). Flowers are generally lilac to purple in color, although white-flowered plants exist. American wisteria has been reported to exhibit remount bloom (Landicho, 2006). Although we have occasionally observed a few sporadic subsequent flowers on various American wisteria cultivars and seedlings, including 'Betty Matthews', none of the late-season flowering has been strong enough to be characterized as repeat or continuous blooming.

The 'Betty Matthews' clone of American wisteria is a wild selection of the species discovered in Cairo, IL, in 1934 by Mrs. Betty Matthews' father. The clone was brought to Mahtomedi, MN, that year and established in the Matthews family garden, where it has grown and been divided (clonally propagated) for many decades. In the early 1980s, Betty Matthews provided some cuttings of the original plant to the University of Minnesota. Subsequently, clones of the original plant were established in several locations at the University of Minnesota Landscape Arboretum and St. Paul campus.

Description

'Betty Matthews' is a fast-growing, twining vine that can reach 4.6 to 7.6 m (15 to 25 feet) in height if it is supported and growing in a moist, sunny to partially shaded site (Fig. 1). Individual plants can become quite dense with basal clumps reaching a width of 0.9 to 1.2 m (3 to 4 feet). New vine growth is pubescent, light green [Royal Horticultural Society (RHS) 146B], turning to a brownish gray (RHS 199B,C) late in the first season of growth. Second-year stems appear gray-brown (RHS 197B,C) on exposed surfaces and brownish gray on shaded surfaces (RHS 199B,C). Mature stems are brownish gray (RHS 199B,C) (RHS, 1995). Leaves are alternately arranged, pinnately compound, with nine to 15 leaflets per leaf. Leaflets have an entire margin, pinnate venation, and range from 2.5 to 7.6 cm (1 to 3 inches) in length with an ovate-elliptical to lanceolate shape and acuminate tip. Newly emerging leaflets are glabrous and glossy green (RHS 137C) on the top surface, a lighter green (RHS 146A) beneath, and have silvery white margins maturing to a deep green (RHS137A) on top with scattered pubescence and a lighter green (RHS 137C) on the bottom surface. Fall leaf color is a mixture of yellow and green (RHS 14A, 17A, 144A, and 153B).

Inflorescences are in the form of an elongated raceme measuring 20.3 to 30.5 cm (8 to 12 inches) in length, comprising 70 to 90 individual flowers (Fig. 2). Unopened inflorescences are a lavender purple color (RHS 77C). The papilionaceous flowers comprise

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Fig. 1. Summer flower display for First Editions® Summer Cascade™ American wisteria (*Wisteria frutescens* ‘Betty Matthews’).



Fig. 2. Closeup of inflorescence, First Editions® Summer Cascade™ American wisteria (*Wisteria frutescens* ‘Betty Matthews’).

Table 1. Mean values of lowest temperatures [°C (°F)] at which acclimated stems of three American wisteria (*Wisteria frutescens*) cultivars tested in controlled laboratory freezing tests exhibited no freeze damage.

Cultivar	22 Jan. 2004 ^z	23 Jan. 2006
<i>Wisteria</i> ‘Betty Matthews’	–39 (–38)	–32 (–26)
<i>Wisteria</i> ‘Blue Moon’	–39 (–38)	–31 (–24)
<i>Wisteria</i> ‘Aunt Dee’	NA ^y	NA

^zNeither cultivar was killed at the lowest test temperature.

^yNA = plant stems too cold-damaged in the field before the freezer test.

two nearly fused upper lobes and three lanceolate lower lobes with the middle lobe being the largest. The upper lobes are violet blue (RHS 91B and 91C) with a pale yellow (RHS 1A) blotch in the center. The keel or lower lobe is violet (RHS 88B). The base (sepals) of the flower are a dull white (RHS 155A) and contrast nicely with the violet petals. Plants produce somewhat flattened seed pods measuring 7.6 to 12.7 cm (3 to 5 inches) in length

that often appear twisted and contain many slightly flattened, oval, medium brown seeds.

Performance

From 2003 to 2012 the ‘Betty Matthews’ clone was grown in a replicated trial at the University of Minnesota Horticultural Research Center (Chanhassen, MN) along with three other American wisteria cultivars that

have been sold in the nursery trade in the Upper Midwest: ‘Clara Mack’, ‘Aunt Dee’, and ‘Blue Moon’ (an open-pollinated seedling derived from ‘Betty Matthews’). ‘Clara Mack’, a white-flowered cultivar, suffered so much cold damage in the trial that it never produced flowers or sufficient undamaged wood for inclusion in controlled laboratory freezer tests. ‘Aunt Dee’ performed better than ‘Clara Mack’ but also exhibited extensive freeze damage on the stem tissue and produced very few flowers. During the trial, three significant winter low temperature events occurred: –31 °C (–25 °F) in 2004, –32 °C (–26 °F) in 2009, and –31 °C (–25 °F) in 2011. ‘Betty Matthews’ suffered no wood damage in these events and flowered fully after the latter two events. Although no data were collected on the performance and winter-hardiness of the original clone and subsequent propagules in landscape plantings before the 2003 replicated trial, accounts from Mrs. Matthews and others who observed the plants suggest it had been fully winter-hardy and flowered annually over the years in the USDA Plant Hardiness Zone 4b locations in which it has grown (winter low temperature –20 to –25 °F; –29 to –32 °C).

In two controlled laboratory freeze tolerance tests, the ‘Betty Matthews’ clone and ‘Blue Moon’ showed similar levels of cold hardiness (Table 1). The freezing tolerance of each cultivar was calculated as the mean of the lowest temperatures at which individual stem samples exhibited no injury (Lindstrom and Dirr, 1989; McNamara et al., 2002).

No specific tests were conducted to determine the range of soil adaptations for the ‘Betty Matthews’ clone of American wisteria. However, the plant has grown vigorously and flowered in Cairo, IL, six different cities in the greater Minneapolis/St. Paul metropolitan area, and in Grand Rapids, MN, over the years, suggesting it is adaptable to a range of soil conditions.

Availability

The University of Minnesota has signed an exclusive license to propagate, grow, market, and sell ‘Betty Matthews’ under the trademark Summer Cascade™ American Wisteria with Bailey Nurseries, Inc. under the First Editions® program. Information regarding ‘Betty Matthews’ and the Summer Cascade™ American Wisteria and First Editions® program can be obtained from Bailey Nurseries, Inc., Plants@baileynurseries.com, 800-829-8898.

Literature Cited

- Cullina, W. 2002. Native trees, shrubs, & vines. Houghton Mifflin Company, New York, NY.
 Dirr, M.A. 2009. Manual of woody landscape plants. 6th Ed. Stipes Publishing Company, Champaign, IL.
 Hightshoe, G.L. 1988. Native trees, shrubs, and vines for urban and rural America. John Wiley and Sons, Inc., New York, NY.
 Integrated Taxonomic Information System. 2013. 3 Oct. 2014. <http://www.itis.gov/servlet/SingleRpt/

- SingleRpt?search_topic=TSN&search_value=27021>.
- Landicho, S. 2006. Planter's paradise. *Amer. Nurseryman* 203:20–26.
- Lindstrom, O.M. and M.A. Dirr. 1989. Acclimation and low-temperature tolerance of eight woody taxa. *HortScience* 24:818–820.
- McNamara, S., H. Pellett, M. Florkowska, and O. Lindstrom, Jr. 2002. Comparison of the cold hardiness of landscape tree and shrub cultivars growing at two disparate geographic locations. *J. Environ. Hort.* 20:77–81.
- Royal Horticultural Society. 1995. Royal Horticultural Society colour chart. Royal Hort. Soc., London, UK.
- U.S. Department of Agriculture, Agricultural Research Service. 2012. USDA Plant Hardiness Zone map. 3 Oct. 2014. <<http://planthardiness.ars.usda.gov/PHZMWeb/#>>.
- U.S. Department of Agriculture, Natural Resources Conservation Service. 2013. PLANTS profile. 3 Oct. 2014. <<http://plants.usda.gov/java/nameSearch>>.