Betula platyphylla 'Fargo': An Asian White Birch for the Northern Plains

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European white birch (*Betula pendula* Roth.) has been the most popular species of birch for landscape plantings due to reliable growth, distinctive white bark, and freedom from most diseases (Santamour and McArdle, 1989). However, susceptibility to bronze birch borer (*Agilus anxius* Gory) has encouraged research and utilization of other species of birch, such as paper birch (*B. papyrifera* Marshall), river birch (*B. nigra* L.), and Asian white birch (*B. platyphylla* Sukaczew). A popular white-barked birch in the nursery trade is 'Whitespire', a cultivar of gray birch (*B. populifolia* Marsh.). It was formerly marketed as a cultivar of Japanese white birch [*B. platyphylla* var. *japonica* (Miq.) Hara]. 'Whitespire' has a narrow pyramidal form and is considered to be more resistant to the bronze birch borer than most white-barked cultivars of birch (Hasselkus, 1984). We selected and introduced a cultivar of *B. platyphylla* 'Fargo' for its distinctive, manicured columnar form, dense canopy, and rich green foliage. It also is highly tolerant to many stresses in the northern Great Plains, such as extreme cold winters, dry hot summers, strong winds, and heavy clay soils with high pH. This new cultivar will offer an additional choice of superior birch for landscape plantings.

Origin

'Fargo' birch was selected from an open-pollinated seedling population of *Betula platyphylla*. Seeds were collected from an open-pollinated tree growing in the North Dakota State Univ. Arboretum near Absaraka and sown in 1986. After the initial screening for growth and vigor, 27 seedlings were planted for further observation in an experimental plot near the North Dakota State Univ. campus,

Fargo. The plot included 202 trees comprising seven taxa: European white birch, Asian white birch, Japanese white birch, paper birch, gold birch (*B. ermanii* Cham.), middendorff birch (*B. middendorffii* Trautv. & Mey.), and grey birch (*B. populifolia* Marsh.). One seedling of Asian white birch exhibited a distinct upright growth habit within the first 2 years of growth. The tree's growth habit and performance were observed continuously over the past 9 years. Color was determined under natural light us-

ing the reprint of the Royal Horticultural Society (RHS) color chart (Royal Horticultural Society, 1966). Hardiness zones cited followed the U.S. Dept. of Agriculture's (USDA) hardiness zone map (USDA, 1960).

Description

'Fargo' birch has exhibited and maintained a narrow, columnar growth habit since it was a seedling. The columnar form appears to be genetically controlled, since the trait segregated in its self-pollinated progenies (nine trees), with branch angles ranging from 30 to 70°. The original tree, now 10 years old, is 9 m tall with a spread of 2.5 m and a stem diameter at breast height (dbh) of 9.7 cm (Fig. 1). The tree is still growing ≈1 to 1.5 m per year. The angle of primary branches averages 39.5° (n = 20, ranging from 35 to 50°). The bark exfoliates slightly when mature. Bark color has gone through a transitional phase during its first 10 years. The color of 3- and 6-year-old stems was grayish-orange (RHS 165A) and orange-white (RHS 159B), respectively, and that of

Fig. 1. Ten-year-old 'Fargo', a cultivar of Asian white birch. The insert shows the white bark.

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the mature trunk was yellow-white (RHS 158C). The multiple colors of stems and trunk are attractive and showy during all seasons. Buddbreak occurs in early May in Fargo. The leaves are simple, ovate-cordate, with a rounded base, with acuminate apices and serrate margins (≈ 5 serrations/cm). Leaf blades are glabrous, ranging from 4 to 7 cm long (average 5.7 cm) and 4.5 to 5.8 cm wide (average 5.2 cm) with six to seven vein pairs. Petioles are 1.3 to 1.8 cm long (average 1.5 cm). Summer leaf color is dark-green (RHS 139A) on the upper surface and duller green (RHS 137C) below. Leaves are retained on the tree until the end of October in Fargo, and leaf color is largely maintained. Fruits (nutlets) are produced in cylindrical catkins, 3.0 to 4.5 cm long (average 3.9 cm) and 0.5 to 0.9 cm wide (average 0.7 cm).

Adaptation and performance

The original tree is well-adapted to Fargo, USDA plant hardiness zone 4a (USDA, 1960), with an average minimum winter temperature of -34°C . The tree did not exhibit any winter dieback or injury in 1996, with a minimum temperature of -39°C . It has been very tolerant to drought and heat, growing well during three consecutive, very dry summers of 1988–90 without irrigation. During June and July, precipitation totalled 4.3 and 5.4 cm in 1988–90, respectively, or only 30% and 41% of the 30 years' average. During the same period, temperature exceeded 33°C in 26 d in 1988 and 14 d in 1989. The tree also tolerates very

heavy clay soil with a pH of about 8.0. Due to its compact growth form, no visual injury occurred during a severe storm with wind speeds of $110\text{ km}\cdot\text{h}^{-1}$ in Summer 1995. Micropropagated plants of 'Fargo' have survived and grown well in Mandan, N.D. (Zone 3b), St. Paul, Minn. (Zone 4a), and central Saskatchewan, Canada (Zone 3a). This suggests that 'Fargo' should adapt well to northern climates in hardiness zones 3 and 4, and perform well in a range of soils.

Currently, resistance of 'Fargo' to the bronze birch borer is unknown. Borers have been present in the planting and have killed several trees in the past 3 years, but 'Fargo' has not been infested. Good adaptation to stressful northern environments indicates that 'Fargo' may be tolerant to the borer, because stress tolerance of birch is a key factor for potential borer resistance (Santamour, 1990). In addition, 'Fargo' has shown less than average damage by the birch leaf miner (*Fenusa pusilla* Lepeletier) among all trees in the densely planted research plot. We recommend planting self-rooted plants due to the tree's adaptation and the chance of an unknown rootstock effect.

Landscape use

An exceptionally manicured columnar form, dense canopy, and rich green foliage make 'Fargo' a very promising new ornamental tree for northern climates. The tree can be planted as an individual specimen, in clumps or groups, or in a row near a residence. It grows

rapidly and displays its distinctive narrow form in a few years without need for future pruning. It is anticipated that its form may widen to become narrowly pyramidal with age. 'Fargo' should be an ideal selection for sites where space is limited, such as a small residential yard, or locations close to buildings and other structures. Leaves with rich green color persist into late fall, providing a unique contrast to typical fall colors of other species of trees.

Availability

'Fargo' is patent pending and cannot be propagated without signing a license agreement. A limited number of micropropagated plants are available for trial. Licensing information can be obtained from Zong-Ming Cheng, Dept. of Plant Sciences, North Dakota State Univ., Fargo, ND 58105 [phone: (701)-231-7405].

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