Fagus grandifolia ‘White Lightning’

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Fagus grandifolia Ehrh. (Fagaceae Dumortier), commonly known as American beech, is found growing throughout the eastern half of North America from Quebec to Florida and west to Ontario, Minnesota, and Texas with a disjunct subspecies, *F. grandifolia* subsp. *mexicana* (Martínez) A.E. Murray extending the range to the cloud forests of Tamaulipas, Hidalgo, and Puebla, Mexico (Govaerts, 1998). Although the European beech (*F. sylvatica* L.) is widely grown in Europe and North America and there are dozens of named selections, there are few named clones of *F. grandifolia* (Dirr, 2009). American beech is better adapted to the southeastern United States and other warm climates than its European counterpart and establishes easily in the landscape, although American beech is generally too large for most residential landscapes. *Fagus grandifolia* ‘White Lightning’ has been selected for its dwarf size, semipendulous habit, and silvery white bark.

Origin

An unusual seedling tree was found in a semicultivated landscape in Chatham County, NC, that the homeowners could not identify. In 2011, staff from the JC Raulston Arboretum (JCRA) at North Carolina State University were called in to verify the identity of the plant. The tree seedling was found growing beside a path in a semimaintained woodland as a seedling from the existing wild *Fagus grandifolia* overstory. The plant’s age was not known but based on subsequent observations of its growth consisting of two flushes of growth per year (personal observation), similar to typical *Fagus grandifolia*, it was estimated to be 4 to 8 years old at that time, although age of *F. grandifolia* seedlings is difficult to determine. Under ideal conditions, the species can grow 275 cm to 365 cm in 10 years (Dirr, 2009) but under the intense competition of a virgin hemlock hardwood stand, it may only reach 90 cm in 14 years [U.S. Department of Agriculture (USDA), Forest Service, 1990]. When it was confirmed that this was a unique form of *Fagus grandifolia*,

the homeowners requested the JCRA take the original plant to the Arboretum, evaluate it, and if appropriate, name and introduce it. It was given JCRA accession number 110211 and grown in a container in 100% coarse milled pine bark for a season before planting out in Fall 2011. It was given the name ‘White Lightning’ in accordance with the International Code of Nomenclature for Cultivated Plants (Brickell et al., 2009) in Dec. 2012.

Description

Fagus grandifolia ‘White Lightning’ makes a small semipendulous tree. It grows with a single trunk, which may require staking when young to grow upright. Without staking, it will act as a low-mounding plant. The size of a low grafted plant at 10 years is estimated to be 180 cm tall and 245 cm wide based on growth rate observations and assuming it has been staked upright and an estimated caliper of 7 cm to 11 cm measured 10 cm above the graft union. The fine branches grow stiffly horizontal before arching downward. Mature leaves are ovate, averaging 11 cm long and 6 cm wide with a SD of 2.16 cm. Foliage in full sun is green [Royal Horticultural Society (RHS) 137C] on the adaxial surface and (RHS 146D) on the abaxial surface (Royal Horticultural Society and Flower Council of Holland, 2007). Approximately 66% of the foliage is retained into mid-January in USDA hardiness zone 7b, but this may be a function of juvenile phase expression. Winter foliage turns tan (RHS 164D). Plants have a fine texture with semipendulous branches (Fig. 1). Stems and trunks are distinctly silvery white (RHS 202D), similar to the paler forms of the species but falling within the range of typical *F. grandifolia* bark. To date, there have been no flowers on the parent plant. Susceptibility to beech scale (*Cryptococcus fagisuga*) and beech bark disease (*Neonectria* spp.) is unknown.

Adaptability

Fagus grandifolia can be grown reliably in USDA hardiness zones 5 to 9. Although there have not been extensive field trials for ‘White Lightning’, it has been grown in landscapes from USDA hardiness zones 6 to 8 (individual plants located in Sewanee, TN, Salem, OR, Raleigh, NC, and Fletcher, NC) with no ill effects at –22 or 38 °C. ‘White Lightning’ has similar cultural requirements

as other American beech, notably full sun to light shade and moist, well-drained, acidic soil (pH 5.0 to 6.5). ‘White Lightning’ will not tolerate compacted or poorly drained soils (Fig. 2).

Propagation and Production

Propagation of ‘White Lightning’ is by pot grafting dormant scion wood on *F. grandifolia* rootstock. Grafted plants of ‘White Lightning’ are slow to grow in production and a Trade 1 gallon nursery pot may take two seasons to finish and will require staking to ensure a vertical trunk before the plant branches and weeps. Stem cuttings of *Fagus* have been rooted by etiolating shoots before budbreak and rooting softwood growth in 3000 ppm indole butyric acid in talc (Bassuk et al., 1984). ‘White Lightning’ has been rooted using this method in low percentages (6% in 2011, 8% in 2012), but rooted cuttings must have a midsummer flush of growth to survive the first winter (personal observation). Scion wood has been distributed to several nurseries but trees are not yet commercially available. Standard pine bark based substrates used for *F. sylvatica* selections work well in container production. Additions of sphagnum, sand, or other amendments to manage irrigation may be necessary based on

Fig. 1. The silvery white bark and semipendulous form as expressed during the winter.

Fig. 2. The original plant after transplantation to the JC Raulston Arboretum at North Carolina State University.

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individual needs. Container plants should be kept moist because *F. grandifolia* growth appears to be influenced by available soil moisture (USDA, Forest Service, 1990).

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