



WOODY

NOTES

## MANHATTAN PLANT MATERIALS CENTER

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### New Woody Plants

Eight new woody acquisitions were added to the Manhattan Plant Materials Center's (PMC) woody observational plantings in 2011, representing the following species: pecan, *Carya illinoensis* (Wangenh.) K. Koch; common persimmon, *Diospyros virginiana* L.; Kentucky coffeetree, *Gymnocladus dioica* (L.) K. Koch; red chokeberry, *Photinia pyrifolia* (Lam.) K.R. Robertson & Phipps; swamp white oak, *Quercus bicolor* Willd.; and Mongolian viburnum, *Viburnum mongolicum* (Pall.) Rehd.

**Pecan**, *Carya illinoensis*, native distribution includes portions of the south central United States (U.S.) and southern portions of the Midwest, stretches northward along the Mississippi River as far north as east central Iowa. As the largest of the hickories, pecan is a long-lived, large (30-45 m tall) shade tree that typically inhabits floodplains and bottomlands. Prized for its sweet, edible nuts, pecan is not only a food source for humans, but also for many birds and mammals. Regarded as the most important commercial nut crop grown in the Eastern U. S., pecan production in the U.S. in 2010 totaled 259,600,000 pounds. Most pecan orchards are found in Georgia, Texas, and Oklahoma. While the probable cold hardiness is USDA Plant Hardiness Zone 5b, the cold tolerance of this accession is expected to be somewhat greater, Zone 5a. However, specimens grown in areas that experience colder climates and shorter growing seasons may exhibit tip dieback in young seedlings, frost injury to catkins, or an inability for nuts to mature. Despite the potential lack of nut production in northern latitudes, this species can still be considered an excellent option as a shade tree. Since this species is adapted to slightly saturated



#### Bright, green, glossy foliage of pecan

Photo courtesy Paul Wray, Iowa State University, Bugwood.org

(anaerobic) soils, its tolerance to compacted, urban soils may be high. Additional positive characteristics include a dominant central leader and dark green leaves. Fall color is insignificant. Five, two-year-old bare-root liners were planted on the PMC May 4, 2011, in Field F-4.

**Common persimmon**, *Diospyros virginiana*, is a small to medium-sized tree, attaining heights of 10-20 m. In the fall of 2010, a collecting trip in southeastern Kansas and southwestern Missouri allowed for a better sense of habitat preferences for persimmon. One could say that the persimmon is quite comparable to the American plum. Commonalities include intense suckering, resulting in thickets, and fruits that are valuable to numerous creatures. Vigorous suckers quickly appear only following severe coppicing, timber harvesting, or fire. Although *D. virginiana* can survive and quickly regrow in areas with occasional fire, areas of high fire frequency will most likely result in its elimination. Fruits are unpalatable before ripening, but rapidly sweeten after frost. Intact fruits do not germinate and are therefore dependent on a variety of animals for dispersal and germination. Fruits are eaten by squirrel, fox, skunk, deer, coyote, raccoon, opossum, various birds, and even humans. Fruit ripening and persistence is variable across and within populations. Since this species is dioecious, obtaining both female and male plants is required for fruit production. Inconspicuous, greenish-yellow flowers appear in early May and are tubular (8-13 mm long). Fruits are spherical to oblate, but variable in size (2 to as much as 5 cm in diameter) changing from green to yellow-green to shades of yellow, orange, or even sometimes purplish. During a collecting trip in 2010, close observations across numerous female clonal patches noted a wide variation in fruit color. The most common habitats were open pastures, fence lines, and forest edges. Ornamental

characteristics include glossy, leathery leaves that can turn a vibrant yellow in the fall. Winter interest includes blocky bark, which is attractive and distinctive, especially on older specimens. This species has the potential to reach 21-24 m in height under cultivation. The provenance of this accession is located near the northern range of its native distribution (throughout the southeastern U. S.); it will be interesting to determine its degree of adaptation to our northern trial sites.

Ames 29625 was collected by Jeffrey D. Carstens in October 2008 as seeds from multiple specimens located in August A. Busch Memorial Conservation Area, located in St. Charles County, Missouri. Five, two-year old liners were planted on the PMC in Field F-4 in 2011. In 1989, seedlings of Ames 7990 were planted in Field F-2. Seeds from Ames 7990 were harvested from a mature specimen growing as a picturesque specimen in the front yard of a private homeowner. It will be interesting to make performance comparisons between these two accessions.

**Kentucky Coffeetree**, *Gymnocladus dioica*, although a member of the legume family (Fabaceae), it is not a nitrogen “fixer.” It is a medium to large, round-barked, native deciduous tree reaching heights of 18-30 m with a spread of 12-15 m. In open areas, the tree produces an open, rounded crown, but in native woods, it grows to 23 m with few branches. Large specimen trees can be found up to 40 m tall, but are uncommon. Kentucky coffeetree’s short trunk, 0.3-0.8 m in diameter, divides into several large branches that end in contorted, stout twigs. Its unique, thick, dark bark is gray to grayish-brown, often marked with deep, irregular furrows and plates that curl at their sides.

The alternate, bipinnately compound leaves are the largest of any native species, measuring from 0.3-0.9 m in length by 4.6-6.1 dm in width, arranged in feather-fashion in 5 to 9 pairs of pinnae, the lowest are reduced to simple leaflets. Typically, the leaves consist of 6 to 14 entire; more or less ovate (almond shaped) leaflets, 5-8 cm long, acute, rounded or cuneate at the base, pubescent beneath when young, short petioled, and swollen at the base. Leaves emerge late in the spring with a striking pink-bronze color, turning to a dark bluish-green above in summer. Fall color is often a golden yellow, but the leaves drop early. Winter buds are small, reddish, and often placed above one another in close formation (superposed). Terminal buds are absent. The buds are small, downy, almost entirely imbedded in twigs, and surrounded by a hairy ring of bark. The stout twigs are light brown to greenish-brown with whitish patches, somewhat zigzag or wavy, large heart-shaped leaf scar, with a wide salmon-pink to brown colored pith.



**Common persimmon, leaf and bark**

*Photo by Robert H. Mohlenbrock, USDA NRCS, 1995. Northeast wetland flora: Field office guide to plant species*

### **Manhattan Plant Materials Center: A Trial Site**

The purpose of this newsletter is to inform cooperators and others interested in woody plants about woody plant trials at the PMC. Many of the entries are part of the USDA Agricultural Research Service (ARS) Plant Introduction System, North Central Regional Plant Introduction Station’s (NCRPIS) NC-7 Trials for which the PMC is a cooperating trial site. Additional entries are provided by cooperating PMC’s, NRCS field offices, and university forestry programs desiring the testing of promising woody plant materials.



**In the winter landscape, chunky brown seedpods on female trees add extra winter interest.**

*Photo by John M. Row, USDA NRCS*

Relatively hardy in USDA Zones 3 to 8, the tree adapts well to urban conditions. It prefers full sun, humus-rich, moist soil, and tolerates drought and occasional flooding. Considering its cultural tolerances, it should be on the list of “tough” trees. Kentucky coffeetree is a fast-growing tree when young with moderate to slow growth as the tree ages attaining 3.6-4.3 m in 10 years.

Accession 9050577 was collected by Chuck Grimes, Hennessee, in Kingfisher County, as a tree of interest and Accession 9050580, a local source growing on the PMC were propagated from seed. Seedlings were planted at the PMC on May 4, 2011, in Field F-4.

**Red chokeberry**, *Photinia pyrifolia*, is native to the southeastern U. S.; its range is from eastern Texas to northern Florida continuing north into New England. Red chokeberry can be found growing in bogs, savannahs, moist rocky seeps, and moist pine barrens as a multi-stemmed, upright (but suckering) shrub reaching 1-3 m tall and 1-1.5 m wide. The genus *Photinia* is rapidly gaining popularity as both a versatile ornamental landscape shrub and nutraceutical fruit crop. With a growing interest by horticulturists throughout the U.S. to use native plants, *Photinia* is an excellent choice as it provides ornamental interest almost year round. In early spring, *P. arbutifolia* displays small (8-12 mm) white flowers arranged in clusters (corymbs) that are commonly visited by small solitary bees, bumblebees, hemipterans, and flies. Flowers are contrasted against dull green leaves that are pubescent underneath. Scarlet red leaves intermixed with shades of green slowly appear in the fall. Over time, eventually all leaves are red. In Ames, Iowa, peak fall color has consistently occurred around the first week in November and tends to last approximately two weeks. After leaves drop, bright red fruits are persistent throughout winter. Although fruits are not initially targeted by wildlife most likely due to strong tannins, fruits are eventually consumed in late winter.



**Colorful fruits and fall foliage of red chokeberry**

*Photo courtesy the Dow Gardens Archive, Dow Gardens, Bugwood.org*

Over the last three years, 47 *Photinia* (formerly *Aronia*) accessions have been collected and donated to the NCRPIS. Nearly all of these accessions were collected by Dr. Mark Brand at the University of Connecticut who is currently building a comprehensive collection of *Photinia* with the objective to evaluate, select, and breed superior genotypes.

PI 658641 was provided as seeds collected by Dr. Joe-Ann McCoy, who is currently employed at The North Carolina Arboretum, Asheville, PI 658641 was collected in Pickens County, South Carolina. One-year old plants were planted in Field F-3 on the PMC. Probable hardiness is to USDA Zone 4.

**Swamp white oak**, *Quercus bicolor*, is a species that has been a favorite for many years and it continues to gain interest in the nursery trade. The native range of swamp white oak extends from central New York west to central Wisconsin, south to portions of Missouri and Illinois, east to portions of Kentucky. Associates include *Q. palustris*, *Ulmus americana*, *Platanus occidentalis*, *Carya laciniata*, and *Fraxinus pennsylvanica*. Generally found in bottomlands and floodplains, it is easy to assume that swamp white oak would perform the best in "swamp-like" conditions. Surprisingly, this is not quite true. *Quercus bicolor* is actually a drought-tolerant species that can perform quite well in an upland situation. Among the



**"Bicolored" leaves of swamp white oak**

*Photo courtesy Paul Wray, Iowa State University, Bugwood.org*

oaks, its more fibrous root system seems to improve its overall success of transplanting, allowing it to exhibit good annual growth shortly afterwards. This species can be easily spotted from a distance by the "bicolored" leaves (whitish undersides). It can also be verified up close by its elongated peduncles. Acorns are highly favored by squirrels, ducks, turkey, deer, and other animals because of their low tannin content resulting in a relatively sweet treat. Acorns generally ripen in early autumn, slightly earlier than most other oaks. Occasionally, a small percentage of seedlings are chlorotic especially when planted in high pH (alkaline) soils. *Quercus bicolor* is valuable for its light brown, close-grained, heavy, and hard wood. Sometimes mistaken for *Q. alba* wood, *Q. bicolor* is more often culled due to knottier wood, since its lower, lateral branches tend to persist longer than in *Q. alba*. Numerous hybrids involving this species exist in the nursery trade.

Ames 29669 and Ames 29670 were collected in October 2008 in Thousand Hills State Park, Adair County, Missouri and Chichaqua Bottoms Greenbelt, Polk County, Iowa, respectively. Surprisingly, Ames 29669 was collected from the higher slopes of a gentle hill, while Ames 29670 was collected in a typical floodplain habitat. Initial observations of 2-year old liners noted somewhat similar fall colors (light brownish-orange, orangish-red, reddish-brown shades) and similar levels of vigor. It is interesting to note slight characteristics of *Q. macrocarpa* (mostly in leaf shape) in some of the Ames 29670 seedlings. This is not surprising due to the large number of mature bur oak specimens growing at Chichaqua Bottoms Greenbelt. Five, two-year old bare-root liners of each accession were planted in Field F-4 on the PMC in a comparison planting. Probable hardiness to USDA Zone 4a.

**Mongolian viburnum**, *Viburnum mongolicum*, is native to Mongolia and the China provinces of Gansu, Hebei, Henan, Neimongol, Ningxia, Qingai, Shaanxi, and Shanxi. Accession Ames 2814 has been growing at the NCRPIS in Ames, Iowa, for 25 years. It has displayed essentially no insect and/or disease problems and has reached a height of approximately 2.5 m. Growth habit is upright and shows no tendency to sucker in a mowed grass plot making it an excellent selection for a homeowner with limited space. It is an extremely durable shrub ready for almost any environmental challenge, having survived well with little care during excessive rains and drought at Ames. Leaves are dull green and densely pubescent making this species potentially useful as a screen/hedge. Impressive white flowers are abundant in early summer. Inflorescences are a compound umbel-like cyme measuring 1.5-3.5 cm in diameter. Fruits are initially red, mature to black, and provide value to wildlife.

Ames 2814 was donated in 1984 by Agriculture and Agri-Food Canada Research Station, Morden, Manitoba, Canada. Vegetative, early summer cuttings from a single clone rooted with ease. Two-year old, multi-stemmed liners were planted in Field F-3 on the PMC in 2011. Probable hardiness to USDA Zone 2.

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### The Bird Tree

The Japanese elm, *Ulmus davidiana* var. *japonica*, located just north of the PMC's office, is not the most beautiful or vigorous tree on the Center. However, the thinly leafed tree, whose branches are covered with Virginia creeper (*Parthenocissus quinquefolia*), makes for a great bird tree. Just about every species of bird capable of perching on a limb that passes through the Bottoms stops at that tree. During migration the tree can be filled with birds. Many can be seen



flying up from their perch in the top of the tree to catch an insect and then return to the tree. They do this repeatedly as they build up their fat reserves before moving on. Planted in 1977, this variety of elm that showed resistance to Dutch elm disease and resistance to elm leaf beetles, today suffers from bacterial wetwood, a common ailment of not only elms, but cottonwood and mulberry. This disease is not uncommon and affects the xylem of many softwood and hardwood trees. The disease is lethal to some species while causing little damage in others. Our elm has suffered from this disease for some time and appears to be on the decline. Last summer's drought was especially hard on the tree including the Virginia creeper. If we lose this tree it will forever alter the landscape. Though by no means attractive, unless you are a bird, the tree has a place in the landscape.

~John M. Row, Plant Materials Specialist

**The Japanese elm, *Ulmus davidiana* var. *japonica*, located just north of the PMC's office**

Photo by John M. Row, USDA NRCS

Plant descriptions appearing in this newsletter were a major contribution by Jeffery D. Carstens, Research Technician, and Dr. Mark P. Widerlechner, Horticulturist, NCRPIS, Ames, Iowa, with edits and additions by John M. Row, Plant Materials Specialist, NRCS, Manhattan, Kansas.