

A History of Tree Planting in West Virginia

Kenneth L Carvell

Kenneth L Carvell is Professor Emeritus of Forestry, West Virginia University; E-mail: KenCarvell@aol.com

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Introduction

West Virginia has often been described by botanists as “the most southern of the northern states, the most northern of the southern states, the most eastern of the western states, and the most western of the eastern states.” Truly, West Virginia, “the Mountain State,” is the cross roads for many species of trees and herbaceous vegetation, and even today we are often surprised by what we find surviving in remote and unique environments.

Early Planting of Non-Native Tree Species

Bald Cypress

I first want to tell a few of my early experiences as a New Englander coming to West Virginia in 1953. I was immediately impressed that Morgantown had 5 large, old bald cypress trees (*Taxodium distichum* [L.] Rich.) in the downtown area. Later, I observed old bald cypress trees in Fairmont and even in Beckley. Curious as to how they got there, at least 320 km (200 mi) north of their natural range, I used an increment borer to determine their age because they all appeared of equal size. My counts showed that they dated from the early 1890s. After asking elderly Morgantowners

how they got their cypress and learning nothing, I turned to reading old newspapers on microfilm. This was a time-consuming type of research, but I found my answer. In 1893, there was a World's Fair in Chicago, the Columbian Exposition. The railroads made it easy to attend because you could buy your ticket at their stations and, as a package deal, get your hotel reservations, transportation fee, and entrance fee to the fairgrounds. In one section of a 1893 newspaper was the sentence, "I watched the crowd getting off the train from the World's Fair, each with their potted cypress clutched in their hand." Evidently all who visited the Louisiana pavilion got a cypress to bring to their hometown.

Japanese White Pine

Soon after I arrived at West Virginia University, I began receiving pressed specimens of tree foliage that had been sent to the President's Office by people from throughout the State who wanted some unknown tree identified. Every so often I would get a specimen of white pine foliage from southern and southwestern counties. There was always the same statement: this white pine grows as a shade tree in front of our farm house. The pine had a variable number of needles in a cluster, and often only one. I had a key to white pines of the world, and it would invariably key down to Japanese white pine (*Pinus parviflora* Siebold & Zucc.). This was the tree identity I sent to them; however, I always felt uncomfortable about my message. Where would rural West Virginians get a Japanese white pine seedling in 1890 or 1900? Further inquiry, however, substantiated my identification. I learned that Ohio was heavily settled before much of West Virginia was even explored. Ohio had tree nurseries at an early date. Since they had to plant tree seeds that were available on the international market, Japanese white pine was one of their crops. Peddlers came southeast from Ohio into southern West Virginia. In addition to their customary cargo, they often had tree seedlings for ornamental planting. The two most popular were Norway spruce (*Picea abies* (L.) Karst.) and Japanese white pine.

European Larch and Norway Spruce

The earliest commercial tree planting in West Virginia was done in 1906 to 1907 in Pocahontas County. Here, the George Craig and Sons Lumber Company had extensive land holdings of spruce-northern hardwood mixtures. To make sure that their cutover areas came back to species of value, they hired a forester in 1906 from the Yale School of Forestry. This energetic and colorful German was Max Rothkugel. In 1906, he ordered European larch (*Larix decidua* Mill.) and Norway spruce seeds from European dealers. These were planted in 1907 by scalping 0.3 m (1 ft) diameter areas and placing a few seeds in each spot. Most of these survived on land later acquired by the USDA Forest Service for the future Monongahela National Forest and are still thriving today, with many larch and spruce of magnificent size. This plantation, along a main road, is appropriately marked as the "Rothkugel Plantation" and described by an impressive sign. Today, we know all the details of this unique planting (Rothkugel 1908).

The Big Stimulus

The Weeks Act

In 1911, Congress passed the Weeks Act that was signed by President Taft on 1 March 1911. This Act authorized the Federal Government to purchase those forest lands needed to protect the headwaters and flow of navigable streams. This law formed the

basis for establishing National Forests in the eastern United States. Equally important, Federal-State cooperation in wildfire control was authorized. West Virginia was one of the first southern states to qualify by passing enabling legislation for establishing National Forest reserves.

When the Weeks Act was being considered by Congress, it was understood that some of the first Purchase Areas would be established in West Virginia because concerns from the frequent flooding in Pittsburgh had been a strong force in passing this Act.

In the high mountain counties in West Virginia, red spruce (*Picea rubens* Sarg.) was a primary species being logged. These sites had invariably burned after they were clearcut. After repeated burns, most of the thick organic soil had been destroyed and the primary plant cover was pin cherry (*Prunus pensylvanica* L. f.), bigtooth aspen (*Populus grandidentata* Michx.), and a dense ground cover of eastern hayscented fern (*Dennstaedtia punctilobula* (Michx.) T. Moore) and western braken fern (*Pteridium aquilinum* (L.) Kuhn). Even where spruce seeds reached such an area, seedlings had little chance of surviving amidst this aggressive ground cover.

After the boundaries of the Monongahela National Forest were formed through land purchase, a major goal was to "reestablish red spruce on every acre formerly supporting these magnificent stands." Outplantings made on such sites in the 1920s usually failed. Red spruce seedlings outplanted on these sites were invariably smothered by the heavy shade of the vegetative cover. If a small spruce happened to survive such competition, it was often flattened by falling dead ferns being weighed down by the first snows. First year survival counts were often only 5% to 10% at best. It was soon learned, however, that Norway spruce and red pine (*Pinus resinosa* Aiton) could survive the harsh climate on these altered sites, survive in the badly eroded soils, and resist the weight of the falling fern cover.

Knutson-Vandenberg Act

In 1928, the Knutson-Vandenberg Act sped up the rate of outplanting on National Forest lands. It provided for a certain percentage of timber sale revenues to be retained on the district and used for timber stand improvement activities that included outplanting wherever needed. This Act was eventually broadened in interpretation to designate a certain percentage of all monies from timber sales into a general KV Fund to be used where most needed.

Very little outplanting of red spruce occurred over the next 80 years after the initial outplantings in the 1920s. Norway spruce seeds were far less expensive, seedlings survived and competed much better, and the lumber from Norway spruce and red spruce was of equal value. Since 2000, however, there has been renewed interest in reestablishing red spruce in many areas of West Virginia. Larger seedlings (3+0 and 4+0 stocktypes) show much higher survival rates. Although this stock is expensive, groups such as The West Virginia Highlands Conservancy have been establishing test outplantings with some degree of success.

I always tell my students that if it is pole- or timber-size planted spruce, and someone asks whether it is red or Norway, always say Norway since so few areas were actually planted successfully with red!

The Civilian Conservation Corps Tree Planting Program

The act establishing the Civilian Conservation Corps (CCC) was passed in March 1933, and by early April a tent camp was operating on the now George Washington National Forest. West Virginia had

68 CCC camps operating at one time or another, and tree planting was a strong part of their program. They relied heavily on Norway spruce for plantings above 975 m (3200 ft) and many of these survived well. With the original topsoil layers gone from years of logging, erosion, and wildfire, they often had to plant two or three buckets of soil with each tree. In spite of the obstacles, many CCC spruce plantations are still thriving. In addition to spruce, they planted large areas of high elevation land with red pine. Eastern white pine (*Pinus strobus* L.) was also a popular species.

Perhaps the most noted of the white pine plantations planted by the CCC is the one at Clover Lick, near Parsons, WV. A Journal of Forestry article described this stand at 25 years of age as putting on over 27 m³ of new volume growth per hectare per year (3 cords per acre per year) at that time (Yawney and Trimble 1958). Research into the seed source of this plantation showed that the seeds were from Buncombe County, North Carolina. This source starts growing earlier in the season than native white pine, and benefits from being planted in deep, rich alluvial soil.

Little consideration was given at that time to seed source. Much open land was planted with red pine that was favored because it had no natural disease or insect enemies. Many of these plantings have done extremely well even though most of the planting stock came from nurseries in Michigan and Wisconsin. There was such a high demand for seedlings during the CCC years that they were pleased just to get all of the outplanting stock they needed without consideration of seed source. It is interesting to note that red pine is actually native in parts of West Virginia, but there are also isolated colonies persisting in the Eastern Panhandle well south of this pine's main range.

Peak Planting Years

The late 1940s through mid-1960s were busy years for tree planting in West Virginia. During the 1930s and 1940s, much farm land was abandoned. Although smaller areas seeded in naturally with hardwoods or conifers, many larger areas had inadequate amounts of tree seeds to cover the entire area. Such areas needed to be planted because most had seeded-in with low-value, bird-disseminated species. During this period, production at the State-managed Parsons Tree Nursery (Parsons, WV) reached its peak. Most of the seedlings produced were eastern white pine, Scots pine (*Pinus sylvestris* L.), Norway spruce, and tuliptree (*Liriodendron tulipifera* L.). In addition, there was an increasing demand for black locust (*Robinia pseudoacacia* L.) to be used in reclaiming strip mines.

In the 1950s, demand developed for species for Christmas tree growers. Although their initial demands were largely for Scots pine, eastern white pine, and red pine, growers soon learned that the popular seed sources of Scots pine for timber production did not retain a desirable green color in the late fall and winter. This reemphasized the need for attention to seed source with all conifer species. The state tree nurseries began buying seeds from the French Limoges area and other southern European sources. It is interesting that privately-owned nurseries gradually sprang up that catered primarily to Christmas tree growers, and growers quickly learned that it paid to buy special seed sources and use nonnative species such as Douglas-fir (*Pseudotsuga menziesii* Mirb. Franco), Black Hills white spruce (*Picea glauca* (Mill.) B.S.P. var. *densata* L.H. Bailey), white fir (*Abies concolor* (Gord. & Glend.) Lindl. ex Hildebr.), and other non-native spruce and fir species. Christmas tree growers even bought older transplants at much higher costs than state nurseries charged. They justified these expenses because growers had learned that appearance, not price, was the basic consideration when selecting the family Christmas tree.

During the 1940s and 1950s, various private pulp and paper companies and saw mill owners also became active in planting open lands. Westvaco had amassed large acreages in the Eastern Panhandle and in west central West Virginia. They outplanted not only Virginia pine (*Pinus virginiana* Mill.) and eastern white pine, but also loblolly pine (*Pinus taeda* L.), shortleaf pine (*Pinus echinata* Mill.), and Pitch-Lob hybrids on old field sites. Many of these seedlings were grown at state-owned nurseries at Westvaco's request and expense.

Clements Tree Nursery Established

Realizing that the high elevation of the tree nursery near Parsons was a disadvantage in many ways, West Virginia bought a large tract along the Ohio River at Lakin in Mason County in the early 1960s and established the Clements Tree Nursery (West Columbia, WV). By 1964, they were shipping trees from this nursery. The earlier spring weather at this location made it possible to start lifting tree seedlings at least a month earlier than was possible at the Parsons Nursery. Foresters, anxious to get their spring planting done as early as possible to assure good survival, had urged the State Department of Natural Resources to acquire this second nursery site. The Clements Tree Nursery is still in operation today.

Critical Research

The West Virginia University Division of Forestry increased its research in revegetating strip mines and in Christmas tree growing during the 1960s. One study showed that black locust outplanted on excessively regraded strip mines usually had poorer survival and growth than those planted on other strip mines due to extremely compact soils.

Many exotic spruce and fir species were planted on a trial basis on Christmas tree growers' lands throughout the State. At their meetings, it was not unusual to hear them discuss their preference for Serbian spruce (*Picea omorika* (Pancic) Purk.), Nikko fir (*Abies homolepis* Siebold & Zucc.), or Siberian-strain Scots pine. Much of this significant research was done by Dr James Brown, who at that time was on the Forestry staff of West Virginia University.

Discovery of the Canaan Strain of Balsam Fir

For Christmas tree growers, the isolated pockets of balsam fir scattered throughout the mountains of West Virginia were found to have many favorable characteristics over more northern balsam. Canaan fir (*Abies balsamea* [L.] Mill. var. *phanerolepis* Fernald), as it is called today, had long been known locally as "blister pine," and locations of the scattered wet sites where it occurred were easy to spot because they were marked on early geodetic maps by such names as "blister run swamp" or "blister pine swamp." During the 1960s, Christmas tree growers recognized its virtues of better needle retention, increased contrast between light and dark green foliage color, and good growth at lower elevations.

Although many areas where Canaan fir occurs naturally have been affected by the woolly aphid, seeds have been collected from these locations, and are now being grown and planted extensively over areas in the Northeast. In my visits to New Hampshire, I run into friends who grow Christmas trees, and they are quick to tell me that they are growing Canaan fir from West Virginia. When I tell them that the correct pronunciation is with an accent on the last syllable, they give me this weird look, assure me that they are correct, and move on.

Summary ---

Clearly, West Virginia has had a rich and varied past with regard to harvest, tree species planted, development of Christmas tree plantations, and associated research. This diverse history has a significant influence on current forest composition and has provided a wealth of information for future forest practices in the State.

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