

# In praise of *Pinus* sp.

A genus of significant horticultural and societal importance.

STORY AND PHOTOS BY  
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**A**s a native Tar Heel (native North Carolinian, not a graduate from Chapel Hill) my entire life has been influenced by pine trees. North Carolina is known as the "Tar Heel State" which originates from colonial production of tar, pitch, rosin and turpentine (for naval stores) from the state's extensive pine forests. The pine tree (all eight native species) was designated as the official state tree of North Carolina in 1963. Other states also proudly claim pines as their state tree including Alabama, Arkansas, Idaho, Maine, Michigan, Minnesota, Montana, Nevada and New Mexico. The genus *Pinus* contains 126 named species globally (a few dozen others in taxonomic dispute, i.e. the twilight zone) and just within the United States pines can claim the title of tallest trees east of the Rocky Mountains, longest cones of any conifer species, heaviest/largest cones of any conifer species, and let's not forget the oldest single living organism in the world. This article will take a look at some of the unique, fascinating, economically important and horticultural relevant uses of this MVP (Most Valuable Plant) genus.

### Whole tree

The historical and economical uses of pine trees and their products has to start with timber for building materials, pulp for paper production, and dozens of others uses including furniture, paneling, floors, roofing, etc. In the 1950s, vast acreages of cutover forest land and degraded agricultural land existed in the southern U.S. According to forest scientists, less than 2 million acres of southern



pine plantations existed at that time. By the end of the 20th century, there was estimated to be over 30 million acres of managed pines in this region making it one of the most productive regions of timber production in the world leading to the nickname "the woodbasket of the world."

Other than the obvious uses of pine trees, their value as ornamental specimens should be commended and appreciated. In landscapes around the world many species of pines (and their cultivars) adorn our urban and rural gardens, container plantings, residential and commercial properties and naturalized areas. The unique form, winter interest, brightly colored barks, texture rich needles, colorful candles (elongated buds)

and simple yet intricate cones make pines exciting and aesthetic beauties (**Fig 1**). These attributes plus the value they have on ecological systems, habitat creation and food sources for wildlife warrant even more consideration for the inclusion of these plants in our landscapes.

Additionally, some pine species play a significant role as Christmas trees. Though a small percentage of production and sales compared to firs, pines can be found for sale as Christmas trees at tree lots, farmer's markets and cut-your-own operations across the country every December. When thinking of the value and significance of pine trees as a whole, one cannot forget the most famous of all... the bristlecone pines (*Pinus longaeva*) found in Utah, Nevada and California.



This is the second article in a six-part series highlighting various horticultural uses of pine trees, pine bark and associated products as well as data from substrate science research trials. Read part one here: [bit.ly/substrates1](https://bit.ly/substrates1)



Noted as being the oldest living trees on earth recorded at 4,850 years old, these majestic gnarly beauties grow high in the mountains where few other things can be found, including tourists (**Fig. 2A-B**). The Inyo National Forest's Ancient Bristlecone Pine Forest should be on everyone's bucket list.

## Wood

While bristlecone pines represent the oldest form of pine trees existing in today's world, one of the youngest/newest uses of pine wood is an organic infill material for synthetic turf fields and playing surfaces called BrockFill (**Fig. 2C-D**). Uniquely engineered to sustain the physical demand of being trampled on and functional demand of supporting turf blades, facilitating water drainage and field surface cooling, it confirms the belief that pine wood is indeed one of the most versatile and malleable natural materials on earth.

Soilless substrates for container production of crops rely on many organic materials to create these products. While not considered a valid or viable component until recently, the use of engineered pine wood products has gained substantial interest and success in recent years. Growers have used pine sawdust and shavings for many decades, especially in woody plant propagation but wood has not been used as a major component in production substrates due to threats of toxicity, fertility issues, fears of rapid decomposition, among other noted concerns. A shift in traditional belief that wood was not good has occurred based on an abundance of science-based data and many success stories from growers who have trialed these materials. More research and published works have been

released on the use of wood than any other organic or inorganic substrate component in the past 15 years.

**Figure 1:** Pines offer tremendous value and ornament to small and large landscapes from their form, bark, cones or needles.





## SUBSTRATES

Researchers have shown that pine wood can be manipulated into many

unique particle sizes and shapes that are suitable in structure to be formulated into substrates for both nursery and greenhouse crops (Fig. 3A-B). Efforts have also been made to reduce, eliminate or overcome issues with fresh pine wood toxicity (phytotoxicity). In Europe, Scots pine (*Pinus sylvestris*) is the primary species for commercial substrate production while loblolly pine (*Pinus taeda*) is the species used most here in the U.S. Other species are also viable candidates and will likely be further explored and utilized in the future.

### Bark

The use of pine bark has been explored and relied upon for many decades. Of all the past and present uses of bark, the two most prominent uses in horticulture are as mulches and substrate components.

As substrates, bark was adopted long before wood was found to be acceptable. Research reports and grower communications dating back to the '50s and '60s highlight some of the early trials of this "waste material." The breakout decade for bark substrates was the 1970s when comprehensive research projects were initiated and completed. Today, the various bark substrate products offered by suppliers across the U.S. are the backbone of the nursery container industry. Not exclusive to nursery production as it was in the past, bark now comprises a substantial percentage of many greenhouse substrates and bagged retail consumer products. Much has been learned and continues to be learned regarding the optimal use of these materials (Fig. 3C-D). An in-depth look into the history and current efforts of engineering bark substrates will be the emphasis of the next (third) article in this series.

The second major horticultural use of bark is in its use as a mulch for land-

**Figure 2:** Bristlecone pines represent the oldest trees on earth [A-B] while one of the newest uses of pines is to create an organic infill product for synthetic turf fields [C-D].



**Figure 3:** Pine wood [A-B] and pine bark [C-D] are critically important soilless substrate materials that can be processed in many ways to create unique products.



scapes, containers and garden beds. One of the most prized mulch products is pine bark nuggets and mini-nuggets (Fig. 4A). These high-end bark products are processed from raw bark that has been

removed from harvested pine trees at the sawmill. Older growth pines that have thicker bark are preferred as the thicker bark produces more large nuggets compared to younger pine trees (pulp wood



for example) that has thinner bark.

Ideally bark from trees harvested for saw timber (40+

years old) is acquired separately

from pulpwood tree bark so that the bark

can be handled and processed differently once at the bark processors.

Other than bark nuggets, pine wood chips are often used as a landscape mulch as well as

colored (dyed) shredded pine wood (Fig. 4B-C).

Bark's use in professional mixes for producing crops and bark and wood

products used by landscapers and home owners, make these pine materials of

tremendous value and importance to the horticultural industry.

### Straw

The last of the major organic mulches,

**Figure 4:** Pine bark nuggets [A], pine wood chips [B], dyed shredded pine wood [C] and pine straw [D] are staple materials for landscape, container and garden mulches.



Photos by Brian Jackson and Brie Arthur

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## SUBSTRATES

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pine straw has been a landscape staple for so many decades. Baled pine straw (Fig. 4D) can be harvested from many pine species but loblolly, slash, and longleaf pines make the best straw for mulching. The needle length of those pines is long enough to interlock once laid on the ground allowing the straw to nestle together to prevent being blown away or easily displaced. Those species are also very abundant in the southern U.S., with loblolly being first followed by longleaf in total production acreage. Always as a note of caution, prevent placing pine straw against buildings (residential) as it can easily ignite and be a possible fire hazard.

### Cones

Maybe one of the least noted or popular products or by-products from pine trees, the value of pine cones should not be underestimated. The use of pine cones as ornaments on Christmas trees has been a family tradition for many for decades. Whether they are strung together, tucked in the tree foliage or placed on hearths and in baskets, pine cones have been welcomed in our homes for a long time. For decades longleaf pine cones (largest conifer cones east of the Mississippi River) have also been used by kindergarteners (or adults of any age who are crafty and fun spirited) to make bird feeders by covering the open cone scales with peanut butter and then covering in birdseed. Regarding the “recent” marketing and commercialization of various pine cones for ornament purposes, they have now evolved into a wide-spread and common product offering in many stores and garden centers year-round. The fascinating beauty of the coulter pine (*Pinus coulteri*) is a stunning piece of interior decoration (Fig. 5 A & D). These cones are the largest (by weight) cones in the world and are only located in areas of southern California. With fresh weights tipping the scales at ~10 pounds, the other common name of this pine tree is “widow maker” as they have reportedly killed more than one innocent bystander when struck by a cones from heights of 60-75 feet. Sugar pine (*Pinus lambertiana*) cones are not as deadly but are equally as stunning speci-



**Figure 5:** Decorative use of pine cones on [A-B] or off [D] the tree is a growing business, while pine cone scales can be used as a container and landscape mulch [C].

mens. Also native to California, these cones claim the prize of longest cones of any conifer in the world. More common than the coulter pine, sugar pine cones are very popular in retail markets especially around the holidays (Fig. 5B).

The most unique use of cones I have seen has been in Europe where they have been used as a mulch material in container nurseries. The separated thick scales of *P. pinaster*, *P. radiata*, *P. pinea*, and *P. sylvestris* make this novel use possible of an abundant resource with no/few other potentials used (Fig. 5C). Pine cones also offer food for wildlife, notably squirrels in the spring when the female (reproductive) cones are fleshy and the seeds are plump and maturing. Pine cones also are prized for their seeds for human consumption (pine nuts). There are about 20 species of pine globally whose seeds are large enough to be collected and eaten. The pollen from pines (staminate cone/

strobili) is also highly valued as having potential healing, anti-aging, and nutritional properties. With over 200 bioactive nutrients, vitamins, and minerals in high concentrations, pine pollen is regarded by many to be one of the most important and beneficial herbal medicines.

And lastly, the pages holding these words (in the print issue of course) are further evidence of the value and utility of pine trees. The diverse and broad-ranging uses, implications, and dependencies that we have for this one plant genus hopefully is a humble reminder of the tremendous role that so many plant genera and species have on our livelihood and overall existence. All biases aside, I think a case can be made that *Pinus* is horticulture's MVP. **NM**

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