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Pine Tree Substrates for Container Crops: Current Status and Overview©

Robert D. Wright
Virginia Tech, Department of Horticulture, Blacksburg, Virginia 24061 U.S.A.

Brian E. Jackson
North Carolina State University, Department of Horticultural Science, Raleigh, North Carolina, 27695 U.S.A.
Email: Brian_Jackson@ncsu.edu

Researchers in the Department of Horticulture at Virginia Tech have been studying the use of ground pine trees, referred to as pine tree substrate (PTS), as a new container substrate for greenhouse and nursery crops since 2004. This research is a totally different approach to container substrate production in that a new material is created for use as a container substrate rather that mining peat or using a by-product of another industry such as pine bark. The development of a new substrate for container-grown nursery crops is very timely since the availability of pine and Douglas fir bark is currently unpredictable due to reduced forestry production and its increased use as fuel and landscape mulch. This article reports the current status of PTS research including plant growth trials, stability during long-term crop production, new methods of substrate construction, PTS storage, and commercialization efforts.

DESCRIPTION AND BACKGROUND OF PINE TREE SUBSTRATE

Pine tree substrates can be produced from freshly harvested pine trees that are chipped and ground (with or without bark, limbs, needles, etc.) in a hammer mill (no plant growth difference was observed with the inclusion of bark, limbs, or needles compared to growing in pine wood only). Loblolly pine (*Pinus taeda*) has been the most promising and heavily researched pine species for substrate production. Current research has also shown the successful use of eastern white pine (*P. strobus*) as a PTS, which greatly expands the potential of producing PTS further into the Northeastern U.S.A. (Wright et al., 2009). The use of loblolly and white pine covers a geographic range which is in close proximity to many greenhouse and nursery operations across a large portion of the country, thereby saving on shipping costs of raw wood materials needed for manufacturing, and deliveries of substrates to growers. Pine trees of any age can be harvested and processed into a substrate. It is even likely that pine plantations could be specifically planted and harvested solely for substrate production. No composting of PTS is necessary, and the trees can be literally harvested one day and used to pot plants the next day after grinding (Jackson, 2008).

PLANT GROWTH TRIALS

The successful production of numerous woody and herbaceous species has been reported in previous research reports, as well as the need for additional fertilizer