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Sweet gum



The Sweet gum tree has been an important species since the Aztec Empire. The sap of the tree can be boiled down to make a balsam that is used to cure skin problems, and various ailments. The sap can also be used for incense or combined with tobacco to form a sleeping agent.

Sweet gum (*Liquidambar styraciflua*) is a deciduous shade tree that can be found from Connecticut to Florida, and in the mountains of Central America ranging from Mexico to Panama. The trees range west all the way to Texas, Iowa and Oklahoma but start to disappear in the harsh climates of the Rocky Mountains. The tree grows moderately fast and is highly resistant to insect attack. The tree has very straight form and is a good species for veneer and lumber. Sweet gum trees typically have a height of 60'-80' but it is not uncommon for these trees to exceed 100'. The crown of these trees is symmetrical shape and have a range 40'-60' in width. The leaves are five lobed and palmate that have a dark green color during

the summer and turns to a burgundy in the fall. The twigs of these trees often develop corky ridges making them easily identifiable. Sweet gum produces a spiny fruit that resembles the mace, a medieval weapon, and is sharp enough to puncture car tires. The trees prefer a deep moist soil, and can often be found in bottomlands and near water.

Sweet gum has a variety of commercial uses such as furniture, veneer, lumber, and pallets. It is a useful species for landscaping, reforestation, land reclamation, and agro-forestry. These trees are very ancient. There are twenty extinct species of Sweet gum known throughout the world; the oldest is over 55 million years old (Jiasuey and Allaire, 1998). Sweet gum's name comes from a reference to the brown sap they produce. This sap has had various uses through out the ages. The first written record of its use was by Don Bernal Diaz de Castillo, a witness to the ceremonies between Cortez and Montezuma in the early 1500's. He wrote,

“After he had dined, they presented to him three little canes highly ornamented, containing liquidambar, mixed with an herb they call tobacco. Although he did not inhale much he immediately fell asleep.”



Timber uses

Sweet gum has been traditionally used as a furniture grade lumber. The sapwood has a nice white color with a pink tint. The heartwood color is variable and ranges from a light reddish brown to a dark reddish brown that resembles cherry. The wood frequently has a nice interlocked grain making it highly attractive for furniture.

The tree has a straight trunk making it ideal for veneer. The logs are sliced to make furniture grade veneers to be used in everything from overlays in furniture to instrument components. The logs can also be peeled to make hardwood plywood.



Medicinal properties

Sweet gum was traditionally used as an incense and medicine well before settlers came to the Americas. The tree produces a light brown sap from the inner bark and wood, which is similar in color to honey from the inner bark, and wood. The balsam (boiled down sap) is traded under the names Copalm Balsam, Peruvian Balsam, Styrae Praeparatus, Prepared Storax, Styrae Liquidus, Flussiger Amber, Liquid Storax, and Balsam Styracis. It is often used as a substitute for Storax and Copaida.

The sap derivatives are often used to cure dysentery, diarrhea iptheria, and pulmonic catarrhs. The balsam is also used to cure gonorrhoea and leucorrhoea in South America. When the balsam is combined with tallow or lard it becomes highly effective at curing skin problems. This mixture has been used to cure forms of skin cancer, and other skin problems like ringworm. The medicinal properties of the balsam come from the extractives found inside it. Cinnamyl cinnamate, ethyl, benzyl, and other forms of cinnamic acid are some of the extractives found in the balsam.



Other uses

These trees have been more recently in reforestation and land reclamation projects. Due to its relatively fast growth and high resilience to insect attack, these trees are idea for these types of projects. The trees are being used heavily in land reclamation of former phosphorous, and zinc mines. As it grows Sweet gum also fixes nitrogen in the soil and provides large areas of shade. The species is a great choice for reforestation on acidic soils and as an agro-forestry species.



Natural habitat

Sweet gum is native to the Eastern hardwood forests of North America. It ranges from Connecticut to Florida and can be found in the bottomlands of these areas. The trees are also found in the cloud forest of Central America. These forests have high levels of moisture due to their elevation and

are distinguished by many epiphytes and ferns. Sweet gum prefers a deep moist soil, and will grow well in both acidic and basic soils.

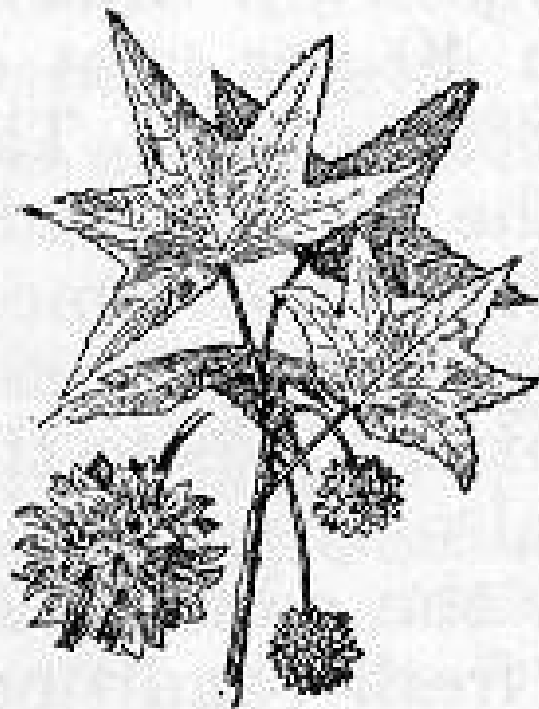


Harvesting

To obtain the balsam (boiled down sap) of Sweet gum a long process must be undertaken. One way to obtain the balsam is by tapping the tree, similar to tapping for rubber or maple sap. The other method is more labor intensive but will yield a higher quality balsam. Grieve (1995) gives a good description of this traditional method she writes,

“The outer bark of the tree is removed, the inner bark is stripped off and thrown into pits until a sufficient quantity has been collected. It is then packed in strong, horse-hair bags and pressed in a wooden press. After removal, hot water is thrown on the bags, which are pressed a second time, when the greater part of the balsam will be extracted. Another account says that the bark is first boiled in water in a large copper over a brick fire, by which process the balsam is separated, and can then be skimmed off. The boiled bark is then put into bags over which hot water is thrown, and submitted to pressure as described above, by which an additional quantity of balsam (Yagh or oil) is obtained.”

After harvesting the balsam it can be placed in container made of glass, ceramic, or plastic and stored until needed.



**Liquidambar styraci-
flua.**



Marketing

Sweet gum is traded under the name Copalm Balsam, or Peruvian Balsam. This is a small market and most of the balsam is traded to Turkey and the Middle East where it is used for incense. The Peruvians have done a good job in recent years of buying their neighboring countries balsam and then marketing it through one large trade name of Peruvian Balsam.



References and information resources

(You may be able to find some of these or other publications in your local library. Another valuable resource is your local cooperative extension office.)

Brown, M.T., R.E. Tighe, T.R. McClanahan, and R.W. Wolfe. 1992. Land Reclamation at a Central Florida Phosphate Mine. *Ecological Engineering* 1(22): 323-354.

Dowd, P.F., L.M. Lagrimini, and D.A. Herms. 1998. Differential Leaf Resistance to Insects of Transgenic Sweetgum (Liquidambar styraciflua) Expressing Tobacco Anionic Peroxidase. *Cellular and Molecular Life Sciences* July. Pages 712-720.

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Nelson, L.E., M.G. Shelton, and G.L. Switzer. 1995. The Influence of Nitrogen Applications on the Resorption of Foliar. *Canadian Journal of Forest Research*. 25 (2): 298-306.

Peterson, A.A., and A.T. Peterson. 1992. Aztec Exploitation of Cloud Forest: Tributes of Liquidambar Resin and Quetzal Feathers. *Global Ecology and Biogeography Letters*. 2 (5): 165-173.

Tolley, L.C. 1983. Effects of Atmospheric Carbon Dioxide Enrichment, Irradiance and Water Stress on Seedling Growth and Physiology of Liquidambar styraciflua and Pinus Taeda." *Dissertation Abstracts International Part: B Science and Engineering* 44 (1), 273.

Wigham, D. 1984. The Influence of Vines on the Growth of Liquidambar styraciflua (Sweet gum). *Canadian Journal of Forest Research* 14 (1): 37-39.

Williams, T.M. 1999. Nitrate Leaching from Intensive Fiber Production on Abandoned Agriculture Land. *Forest Ecology and Management*. 122 (1-2): 41-49.





Electronic resources

(The following list contains the addresses of websites, which were felt to be most helpful and containing reliable sources of information.)

Grieve, M. 1995. Botanical.com: A modern herbal home page.

<http://botanical.com/botanical/mgmh/s/storax93.html>

Scheper Interactives L.C., Floridata homepage-Liquidambar styraciflua.

<http://www.streetside.com/plants/floridata/ref/liquidam.htm>

EPA web site on the benefits of using Sweet gum to clean contaminated soils.

<http://www.clu-in.org/products/newsletters/trend/tt1099.htm>

Jiasuey and Allaire. 1998. University of Connecticut dendrology web site.

<http://www.lib.uconn.edu/CANR/plsci/mbrand/liquidambar/liquidambar1.html>

Wellesley University dendrology web site-Liquidambar styraciflua.

<http://www.wellesley.edu/Activities/homepage/web/Species/psweetgum.html>

North Carolina State University, Department of Wood Science Home Page.

<http://www.courses.ncsu.edu/WPS202/hardw.id/dpinfo/sweetg.html>

Peterson, John. Virginia Tech Dendrology web site- Liquidambar styraciflua.

<http://www.fw.vt.edu/dendro/dendrology/sylabus/liquidambar.htm>

USDA Forest Service. Fire Effects

Information. Index of Species Information

<http://www.fs.fed.us/database/feis/plants/tree/liqsty/>

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This is part of a series of fact sheets on non-timber forest products. The full set of fact sheets is available at the Non-timber Forest Products website: <http://www.sfp.forprod.vt.edu/>

Please give us your comments on this fact sheet and suggestions for future fact sheets. Direct your comments to Tom Hammett, Department of Wood Science and Forest Products, 210 Cheatham Hall (0323), Virginia Tech, Blacksburg VA 24061. Phone: (540)-231-2716. E-mail: himal@vt.edu.

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