

Maple Shade Tree Production *(draft)*

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Species grown in Middle Tennessee: Buyer's Guide is excellent list:

<i>Acer platanoides</i>	Norway Maple
<i>A.p.</i> 'Crimson King'	Crimson King Norway Maple
<i>A.p.</i> 'Deborah'	Deborah Norway Maple
<i>A.p.</i> 'Emerald Queen'	Emerald Queen Norway Maple
<i>Acer rubrum</i>	Red Maple <i>see last few pages</i>
<i>A.r.</i> 'Autumn Flame'	Autumn Flame Red Maple
<i>A.r.</i> 'Embers'	Embers Red Maple
<i>A.r.</i> 'Fairview Flame'	Fairview Flame Red Maple
<i>A.r.</i> Red Sunset	Red Sunset Red Maple
<i>A.r.</i> October Glory	October Glory Red Maple
<i>A. saccharinum</i>	Silver Maple
<i>A. saccharum</i>	Sugar Maple
<i>A.s.</i> 'Green Mountain'	Green Mountain Sugar Maple
<i>A.s.</i> 'Legacy'	Legacy Sugar Maple
<i>A. x freemanii</i> 'Armstrong'	Armstrong Red Maple
<i>A. x f.</i> 'Autumn Blaze'	Autumn Blaze Maple
<i>A. x f.</i> 'Jeffers Red'	Jeffers Red Red Maple

Propagation

Propagation is easy by rooted cuttings; softwood, under mist, 1000–3000 ppm IBA, in 4 weeks. Tissue culture has been successful. There is a bud incompatibility, so don't bud. It is illegal to propagate patented or trademarked plants without obtaining grower's rights from the owner.

Most of the cultivar liners are purchased 6' tall from Oregon nurseries for \$20-25 each. John Holmlund Nsy-800-643-6650; Hans Nelson Nsy-503-663-3348, Trudie Hayes is local rep. 931-668-7945, 888-409-7846; J. Frank Schmidt-503-663-4128 are sources. There are many more.

Several local nurseries are rooting red maple cultivars: Carl Bouldin-931-668-9339; Greenwood Nsy-931-668-3041; Phytotektor-931-469-7286; Stoner Nsy-931-934-2169. Red maple cultivars are not budded because of 'bud incompatibility' (fact sheet available), yet a rumor says budding onto a northern seedling raised from seed collected in the north is okay.

Several of the large seedling producers like Hillis, Warren Co., High Country, and Bottoms grow a lot of the red, silver and sugar maple seedlings that are raised and sold as seedlings.

Standard nursery practice of seedling production:

The seed are planted in a seedling row. They will be there 1-2 years. They are then generally barerooted and sold to be transplanted into a container or in a field at a spacing to ball. They will grow for 1-2 years to establish a root system. They may be 3 feet tall, but not straight enough. They will be cut back in March to 1.5 - 2 inches above the soil. A bud will sprout. The established root system will be able to grow the new top fast; fast growth is straight. Three to four years are required to get a straight 3-4 foot seedling by the standard nursery practice.

Accelerated growth with new technology: the Ohio Production System or OOPS by Dr. Dan Struve. Alan Stoner and Mark Kuykendall in Warren Co. have been successful with this method. Rennerwood in Texas also produces a nice liner fast.

The OOPS uses heat and artificial lighting to go from seed or rooted cutting to a 5-6 foot liner in less than 1 year, Jan to Oct., in 1 growing season.

Rooted cuttings are potted into 1 gallon containers. Seed are planted in Jan-Feb in a heated greenhouse in a bed, transplanted to 1 gallon containers in a few months, a combination of incandescent and Sodium lights extend daylength and stimulate rapid growth. Shift to 3 gallon containers and move outside in May, space to allow some lateral branching so as to increase caliper, don't over fertilize, stake if necessary-but allow some movement to build stem strength. The pine bark media contains some slow release fertilizer, but liquid feeding is also done.

Site Selection

No special requirements. Soil does not have to be as well drained as for dogwood, white pine, peach, or hemlock, but is fine if available. Red maple can tolerate a medium drained soil, so to speak.

“Red maple grown on high ground develop a tap root, those grown in low ground does not.” Ken Tilt, 1-9-91; currently Auburn’s Nsy Spec. (formerly Nsy. Spec. for UT).

Fertility

Maples grow best in a pH range of 6.0-7.0. A medium to high level of phosphorus and potassium is desirable. Soil test early enough so that any lime, phosphate or potash can be broadcast prior to planting.

Sidedress Feb-March and late June with no more than 75 pounds of actual nitrogen per acre. Refer to the fertility section for examples of 75 lbs. The first sidedress

application after being transplanted should be no more than 50 lbs. of actual nitrogen per acre.

Field Spacing

Spacing of shade trees in the field depends upon the size expected to be harvested and machinery available.

Plant a minimum of 5-6 feet apart within the row to harvest a 1.5 - 2 inch caliper tree. Middles should be at least (width of widest tractor or implement used in middles plus 1 foot per side = 5' implement + 2' = 7' middle.

Spacing examples of trees on 1 solid acre:

5x5 = 1,742	6x6 = 1,210	4.5 x 5 = 1,936
5x6 = 1,452	6x7 = 1,037	4.5 x 6 = 1,613
5x7 = 1,245	6x8 = 908	4.5 x 7 = 1,383
5x8 = 1,089		4.5 x 8 = 1,210

Remember to skip a row or leave a 10-12 foot roadway to load and spray from. Consider 4-8 rows per block. If hand dug, how far do you desire to carry 300 pounds? An air blast sprayer is convenient for pest control. An air blast sprayer should be able to penetrate the foliage on 4-8 rows of shade tree foliage. A tree spade will also require space to maneuver without damaging adjacent plants. A 4 row block offers 50 percent of its plants immediately accessible to a spade.

"It's not how many trees you plant per acre that will make you money; it's how many trees you sell per acre that is important." -Dr. Carl Whitcomb, in McMinnville, Tenn., Oct, 1991, speaking to the MTNA trade show educational audience.

Planting

Do not plant too deep. It is also critical not to allow cultivation to throw additional soil over the roots. Some producers replace the disc blade that throws the soil with a smaller diameter blade. Roots too deep cause a plant to be unthrifty or die. Should be able to see the normal root flare.

Do not try to hide the cut-back crook with soil by planting it deep. The crook produced by cutting back will be more obvious on some than others. Some will be culls. (Referring to the section on "Standard nursery practice of seedling production")

Insects

Refer or request the handout on the Maple tip borer and the shade tree borers for the complete story. **Spray Dursban 4E (Chlorpyrifos) in mid-May and again in late June to prevent the Flatheaded Appletree Borer.** Wet the entire trunk from two sides with a back-pack sprayer or hand-gun at the following rates: 2 teaspoons per gallon or 1 fluid ounce/3 gallon or 1.3 ounces/4 gallon or 16 fluid ounces (or 1 pint)/50 gallon or

32 fluid ounces (or **1 quart**)/**100 gallon**. The rate is 1 qt. per acre if an air blast sprayer is used. Dursban is also marketed under the Chlorpyrifos name.

Prevent losing the terminal from damage caused by a **shoot boring caterpillar**, by spraying Talstar in April when the second pair of new leaves have come out and each leaf is about the size of a nickle. It has been approximately April 20 in the past. More than 2 sprays have been useless on cultivars. Seedling trees will require 2-3 sprays, 5-7 days apart, because of the variability in development. (Some trees can be in full leaf while a few may still be in tight bud.)

Talstar Flowable should be sprayed at 12 fluid ounces per 100 gallons of water ; 1.2 fl oz per 10 gallons; 14ml or 1 Tablespoon per 4 gallons; 10.5ml per 3 gallons; or 3.5 ml per gallon.

The **potato leafhopper** stunts growth (by causing short internodes), cups new foliage, and causes a browning of leaf margins referred to as hopper burn. The insect is difficult to find, but the damage is obvious. Spray Sevin, Dursban, Talstar, Tempo, Decathlon, or Scimitar at first sign during late spring and summer.

Refer to UT Ext. pub. 1589 for a complete list of potential insects and the recommended controls.

Disease

Refer to UT Ext. pub. 1234 for a complete list of potential diseases and the recommended controls.

Herbicides

Refer to UT Ext. pub. 1226 for a complete list of labeled pre and post-emergence herbicides.

Pruning

Maples are opposite budded and therefore have a great tendency to fork or have a double leader. Anything that damages the terminal causes a forked tree; a cull, unless someone pays attention to detail. The damaged terminal must be cut away. Select a strong bud to become the new central leader. A bud on the Southwest side of the trunk has the wind to assist it in becoming straight. Pinch or cut off the other bud.

Maintain 1 central leader. Leave lower foliage or branches on to build caliper and a strong stem. Lower branches can be shortened to 6 inches, so as not to interfere with cultural practices.

Producers tend to remove lower foliage and branches too soon and too high. Producers want trees to look like trees every year. But research has proven the value of leaving lower foliage and branching to build stem strength and caliper. Remove large limbs periodically to avoid larger wounds later. Most lower branching can be removed 1-2 years before the anticipated harvest and the wounds will have time to heal.

The height that shade trees are limbed up to is decided by the buyer and the purpose. Trees planted into the landscape are generally limbed up to 4 feet; while street trees may be required to be limbed up to 5 to 7 feet or so for increased visibility.

Harvesting

The most requested size of shade tree is 1.5 - 2 inch caliper, which is generally a 5-6 year crop; depending on species, soil type, fertility, moisture, growth rate, pruning, etc; with harvesting occurring the last 2-3 years.

Digging the Correct Size Ball

The American Standard for Nursery Stock was written by the American Nursery & Landscape Assoc. (ANLA) (formerly the American Assoc. of Nurserymen, AAN). It establishes techniques for measuring plants and rootball size for particular plant sizes and different plant types. A copy of the Standards may be obtained by contacting the ANLA at 202-789-5980 ext 3019 for a few dollars.

The minimum root ball diameter of many of the common shade trees is provided.

Table 5
Shade Trees

<u>Caliper in inches</u>	<u>Minimum Root Ball Diameter</u>
1 1/4	18 inches
1 1/2	20 inches
1 3/4	22 inches
2	24 inches
2 1/2	28 inches
3	32 inches
3 1/2	38 inches
4	42 inches
4 1/2	48 inches

References:

"American Standard for Nursery Stock", American Association of Nurserymen, ANSI Z60.1-1996, approved Nov. 6, 1996, Section 1: Shade Trees.

Dirr, Michael A. 1998. Manual of Woody Landscape Plants, Stipes Publishing, Champaign, IL. 5th ed.

TNLA Buyer's Guide, 2000-2001.

Recent US National Arboretum Releases

Acer rubrum '**Red Rocket**' and *A. rubrum* '**New World**' are two new red maple cultivars that have some resistance to the potato leafhopper, released in 1998.

US National Arboretum scientists started a test 20 years ago with 3,500 trees on an Ohio plantation. They observed over the years that two trees were more hardy and colorful than the others. In a test for potato leafhopper resistance, 'Red Rocket' had only 2 percent leaf damage compared with 9-10 percent on the other commercial cultivars.

These two new cultivars are also extremely cold hardy to temperatures as low as minus forty degrees. Both trees come from northern Minnesota, a key to understanding their successful tolerance. They are lovely trees for urban and suburban landscapes in northwestern and Midwestern American cities.

'**New World**' has orange-red leaves, branches up and out and weeps at a high level - a unique shape that offers excellent shade. It's height can reach 31 feet and a width of more than 15 feet.

'**Red Rocket**' has fiery red leaves in the fall and can grow to 35 feet with a width of 8 feet. It is possible that commercial nurseries will have softwood cuttings of these trees by 2000. (from American Nurseryman, March 15, 1998).

They may not grow very fast for us in our Tennessee production fields, but might be worth a trial for those with a northern market. Coming from the National Arboretum, they won't be patented or trademarked.

mapl-new.nn Dec 2, 1998

Three medium-sized red maple cultivars, with medium-green leaves in summer were released in 2000. These are males, producing only male flowers, thus no fruit or nuisance seedlings are produced. They are adaptable to a wide range of soil conditions.

They have a significant level of tolerance to potato leafhopper — better than or comparable to many commercially available red maple cultivars in long term tests in Maryland and Ohio, according to the news release.

'**Brandywine**' is hardy in USDA cold hardiness zones 4-8. It is the result of a cross of *A. rubrum* 'October Glory' and *A. rubrum* 'Autumn Flame'. Autumn coloration begins in mid-fall and lasts up to 14 days or more, gradually turning from red to a brilliant red-purple. It is moderately columnar in shape. It will grow 25 feet tall with a 12 foot spread in 12 years. Fall color peaks between 'Autumn Flame' and 'October Glory' in Maryland (zone 7).

'**Somerset**' is cold hardy in zones 4-8. 'Somerset' is a cross of *A. rubrum* 'October Glory' and *A. rubrum* 'Autumn Flame'. 'Somerset' appears to color well as far

south as Georgia. 'Somerset' will reach a height of 23 feet, with an 11 foot crown spread in 12 years.

'Sun Valley' is hardy in USDA cold hardiness zones 4-7. It is the result of a cross between *A. rubrum* 'Red Sunset' and *A. rubrum* 'Autumn Flame'. 'Sun Valley' will grow to 21 feet tall by 10 feet wide in 10 years.

maple-new red cultivars June, 2001

The U.S. National Arboretum does not patent or trademark it's plants.

Maple Prod. March, 2002 crop disc