White Pine Production

Pinus strobus

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Liner Selection

Conifer seedlings are produced as 1-0, 2-0, 1-1, 2-1 or 2-2's. The numbers refer to the number of years in the seedling bed and transplant bed respectively. A 1-0 is only 1 year old and is too small to go straight to the field. A 2-2 is 4 years old.

A list of conifer liner sources is available. The Tenn Div of Forestry offers a much better quality liner than they use to. Their 2-0's will be 8 to 12 inches tall. When larger seedlings are not available, consider planting the (1-1, 2-0, 2-1) seedlings into a liner row or transplant bed for 1-2 years with irrigation. Let the seedlings grow a larger root system before being spaced out to ball. This frees up some land. It also allows the expected mortality to occur without tying up land for 5 years.

Site Selection

White pines require a deep, very well drained soil, like dogwood and peach. Select a site without a fragi-pan; where water never stands.

Field Spacing

Spacing of White Pines in the field depends upon the size expected to be harvested. Pines are sold as conical or pyramidal coniferous evergreens and properly grown material should not be less than a 5 to 3 height to spread ratio, according to the ANLA Nursery Standards. For example, a 5 foot White Pine should be at least 3 feet across at the base. A 7 foot White Pine should be at least 4 feet wide at the bottom. The height of coniferous evergreens is measured midpoint between the upper-most whorl and the tip of the leader.

Plant a minimum of 5 feet apart within the row to harvest a 6 foot White Pine and 6 feet apart to produce a high quality 8 foot White Pine. Middles should be at least (width of widest tractor or implement used in middles plus 2.5 feet per side = 3' implement + 5' = 8' middle. It is critical that sunlight reach the lower branches to keep them vigorous and strong, so they will remain long.

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 4-6 rows per block. If hand dug, how far do you desire to carry 500 pounds? An air blast sprayer will be required for pest control. An air blast sprayer should be able to penetrate the foliage on 4-6 rows of dense pine 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.

Fertility

Soil test early enough so that any lime, phosphate or potash can be broadcast prior to planting. White pines grow best with a soil pH of 4.5-6.0. A low or medium level of phosphorus and potassium is more desirable than a high level. Some producers don't fertilize if they get decent growth and color. They fertilize the last year for color.

Fifty pounds of actual nitrogen per acre is sufficient for the conifers. More will only stimulate excessive plant and weed growth, requiring more growth pruned off and greater weed control efforts. Sidedress Feb-March and late June. Examples of 50 lbs. of actual nitrogen per acre: 150 lbs. 34-0-0 or 250 lbs. 20-10-10 or 385 lbs. 13-13-13 or 333 lbs. 15-15-15 per acre.

Insects

Refer to UT Ext. pub. 1589 for a complete list of potential insects and the recommended controls. Frequent insect pests in Middle Tennessee are bagworm and pine bark adelgid. The adelgid looks like a white cottony lint on the trunks, branches and terminals when highly infested. Dormant oil is the best defense in Feb-March.

Effective spraying does not remove the pest residue or cause it to change colors to indicate that it has been controlled. Spray success can be determined by rubbing the trunk or branches with a hand. Living adelgids leave your hand sticky. Dead ones will be dry and powdery when rubbed.

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-emergent herbicides. Weeds must not be allowed to shade out lower foliage. Devrinol, Factor/Barricade, Gallery, Kerb, Pendulum WDG, Pennant, Princep/Simazine and Surflan are labeled for pre; and Envoy, Fusilade T/O, and Vantage are labeled for post use presently.

Pruning

White pines should be pruned in late June or early July, (a little later at higher elevations.) The job must be completed in time for the buds to set for next year.

White pines can be grown and sold as natural (no pruning), sheared, semi-sheared or semi-pruned. Most white pines are planted for a screen, to hide an ugly view or to provide privacy. Natural white pines don't serve this purpose well, because they are too open. But natural pines are easier to grow and cheaper to buy.

A sheared, semi-pruned or semi-sheared white pine offers much more privacy and screening ability than a naturally grown pine. Pruning increases plant value and quality. These trees must sell for more money, due to the increased labor. Shearing requires the most time, effort and ability; but commands the higher price. The instrument used may be manual hedge shears, knife, or powered shears.

The leader should be limited to 10 inches of new growth in a plant intended for Christmas tree use. The leader of a sheared landscape plant should be left no longer than 14 inches. Maintain only 1 central leader, regardless of the method.

I recommend considering the SAJE powdered device for speed and uniform appearance. It shears hemlock and the upright hollies as well. The motor is carried on a backpack frame and powers a 6 foot sickle bar held at an angle while the operator walks around each tree. Uneven terrain can make the task more difficult.The SAJE is heavy and most workers like to rest every hour or so. But the uniform quality is amazing and makes the effort well worth the trouble. Several local producers like theirs. A source is 1-800-530-7218.

A semi-sheared tree is only sheared the last year or two prior to being sold, to produce a thicker outer shell of needles. A semi-pruned tree is pruned every year except the first 2.

Semi-pruning takes 5-15 seconds per tree per year. Only one cut is required on most trees. Cut the central leader 12-14 inches above the newest whorl of branches. (If there is a double leader, remove one.) If the remaining central leader is still taller than the new lateral (side) branches, then move to the next tree.

If the central leader is shorter than any of the new lateral branches, then cut the taller lateral branches back enough to remain subordinate.

The central leader must be taller in order to maintain dominance. Otherwise, a taller lateral will become dominant, take over as the new central leader, and produce a major crook in the stem.

So, the height that the tree grows and the distance between branches is controlled by how much the leader is allowed to grow per year. A more effective screen is produced.

A person can walk down the row making 1-6 cuts per tree with hand pruners. All of the cuts are in the top, requiring 5-15 seconds per tree and increasing the QUALITY immensely over a natural tree.

Remember to be alert for snakes, wasps and hornets. Drink liquids and be alert for heat exhaustion. Don't do this type of work alone in remote areas. Wear the proper safety equipment.

Leg guards, boots and protective gloves are essential when shearing with a knife. Carry a stick in the idle hand or hook a finger in your belt to keep it busy and avoid cutting it.

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.

A naturally grown white pine that has never been pruned can be dug with the ball sizes listed in Table 16 on page 21 of the Standards, in the Coniferous Evergreen section. A portion of Table 16 is reproduced below. The minimum ball size is stated based on the tree height. Rather straight forward, but how do you measure the height of a natural white pine and be fair to the buyer? Afterall, the leader may be 24-30 inches taller than the first side branch. Figure 18 on page 19 of the Standard states, "The upper limit for determining average height for type 4 conifers (white pines) is midpoint between the uppermost whorl and the tip of the leader."

Section 3.2.1, page 21 has an interesting statement: **"Note:** Where it has been a cultural practice to shear, prune, disbud or otherwise impede the natural growth rate of this group of plants, ... trunk diameter shall be used to determine the minimum ball size of trees. Measurement of trunk diameter shall be made within 6 inches above ground level. Minimum ball diameters shall be those established under Section 1.3.1 "Shade Trees", Types 1 and 2 on Table 5. Ball depth shall also be established as in Section 1.3.4 (Ball Depths)." A portion of Table 5 is reproduced below. These specifications are for hand dug or machine dug balls.

A 6 foot semi-pruned white pine with a 3 inch trunk would require a minimum of a 32 inch root ball; while a natural pine would require a minimum of a 22 inch root ball. Sheared and semi-sheared white pine trees require a larger rootball than natural white pines to survive. It makes sense because a sheared tree has more needles to be fed.

Producers are not legally bound to follow the ANLA Standards. Buyers should ask if a nursery follows the Standards before placing an order or include it on the bid sheet or Spec. Sheet.

Producers must be watchful of the plant QUALITY leaving their nursery. Ball size and condition is a major consideration. If we strive to ship the same QUALITY that we would expect to receive, then the Middle Tennessee Nursery Industry can only grow. Integrity and honesty is extremely important in successful business dealings.

Table 16

Natural Conifer

Height	Minimum Ball Diameter
4 feet	16 inches
5 feet	20 inches
6 feet	22 inches
7 feet	24 inches
8 feet	27 inches
9 feet	30 inches
10 feet	34 inches
12 feet	34 inches
14 feet	42 inches
16 feet	46 inches
18 feet	50 inches

Table 5

Sheared or Semi-Sheared

Caliper	Minimum Ball Diameter
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
5	54 inches
5 1/2	57 inches
6	60 inches
7	70 inches