

Seedling Production at Oklahoma Forestry Division Forest Regeneration Center¹

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The Oklahoma Department of Agriculture's Forestry Division has been supplying tree seedlings for conservation plantings since 1927. The Forest Regeneration Center near Goldsby distributes 4 - 42 million seedlings annually. This includes bareroot one year old hardwoods, bareroot one and two year old conifers. The Division also manages a southern pine seed orchard.

The Oklahoma Forestry Division has been growing and distributing tree and shrub seedlings for Oklahoma's private landowners for almost as long as it has been in existence. From a meager beginning at Stillwater (in northcentral Oklahoma) in 1927, Oklahoma's State Tree Nursery moved first to Stringtown in 1938, and then to its present location south of Norman in 1945.

The Forest Regeneration Center at Washington produces hardwoods and conifer seedlings. It was formerly one of two nurseries operated by the Forestry Division. From 1949 until 1977, the Division grew southern pine seedlings at its nursery in southeast Oklahoma. Because of the need for modernization, and the high cost of operating two nurseries, a decision was made to contract the production of southern pine seedlings to the Weyerhaeuser Company nursery in southeast Oklahoma.

The purpose of the Regeneration Center is to provide Oklahoma's private landowners with quality tree and shrub seedlings for planting on their lands. These seedlings are sold state-wide for a variety of purposes. Including wildlife habitat improvement, wind-break establishment, fuelwood, postlots, erosion control plantings, Christmas trees and timber production.

The Regeneration Center had 65 acres under production. Currently we produce 20 species of hardwoods and 9 conifer species. Our annual production is 4 to 41 million seedlings. Currently the Forestry Division contracts with Weyerhaeuser to produce one year old improved loblolly pine seedlings. We also contract with Colo-Hydro of Longmont, Colorado for the production of conifer tublings used for planting on selected shallow, droughty soils of western Oklahoma.

The soil is a sandy loam "second-bottom land" soil, slightly basic. Each year we have soil samples analyzed through the State University of New York and amend each field accordingly to reach optimum nutrient levels for seedling production. For example, we will add sulfur to lower ph on specific fields; and manure and sawdust on every field to raise organic matter and improve soil texture. Fields that are not in crop production are planted to sudan grass cover crop in the spring. The cover crop will be mowed regularly throughout the growing season. Prior to winter the cover crop will be plowed and the field will be prepared for a spring planting. Generally, we have a field in cover crop every other year. We have two wells that pump to a 210,000 gallon storage tank from which all field irrigation is pumped. The entire nursery can be irrigated through a network of underground mainlines and field groundlines.

The seed for producing our crop is either collected from proven quality local Oklahoma sources; or purchased from reputable seed dealers, source-identified.

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We have been working closely with the Soil Conservation Service/Plant Materials Centers and Oklahoma State University in identifying those varieties that will exhibit specific traits deemed desirable, such as faster growth rate, drought-tolerance, frost-hardiness, disease-resistance, etc. Several varieties have been identified and seed production areas of those varieties have been established near the Regeneration Center. All seed is processed and stored at the seed extraction building.

All the hardwood species we produce are one year old seedlings. Seven species are fall or winter sown, and the remainder are stratified and planted in the spring. Because of our longer growing season, some species can become quite tall. For example it is more the rule than the exception for black locust sown in mid-June to be seven feet tall by October with little if any irrigation or fertilization. Of the nine species of conifers we produce, six are spring sown, two year old seedlings. Through fumigation and proper soil management we anticipate producing our improved Virginia pine and limited quantities of improved loblolly pine in just one season. The remaining conifer, bald cypress, can easily reach plantable size in one season. Immediately after the beds are sown, we apply a light layer of fine sawdust followed by a layer of hydromulch. This is done to help retain soil moisture, reduce soil temperatures and prevent "wash-out" in the event of severe spring showers.

Weeds are fierce competitors for soil moisture and nutrients. We try to maintain a weed-free nursery through the use of registered herbicides, mechanical weeding machines and seasonal labor. Over the past 10 years we have been working with State University of New York and Dr. Larry Abrahamson in testing those herbicides that will control weeds and not effect seedlings. The effort has produced outstanding results; we have 90% of our tree species under chemical-weed control. The program is still on-going for those newly acquired species. Regularly when the seedlings are 4-6 inches in height, we will use a mechanical brush hoe to control weeds in seedbeds. Not only are weeds controlled, but an additional benefit is the break-up of the soil crust in the seedbed. Our last line of defense in the great weed wars are seasonal personnel, armed with hoes, weeding knives and/or round-up herbicide applicators. During the course of the summer our temporary crew numbers 5-7 people.

A comprehensive lateral root pruning and root wrenching schedule is followed to develop fibrous root systems of conifers and hardwoods for improved outplanting survival.

The seedling harvest season at this nursery begins late November/early December and ends mid- to late March. Winters in Oklahoma tend to be wet and cold with occasional snow. Usually in January we experience a two to three week freeze and all harvesting comes to a halt. After that time the ground thaws and harvesting resumes. In the past a Grayco Seedling Harvester was used to lift the seedlings; now we use exclusively Fobro lifters. All seedlings are processed and counted before shipment. The seedlings are graded as per accepted industry standards for height and caliper, grouped into 50's and machine-tied. A heeling-bed is used for temporary storage of hardwoods. The seedling cooler is used for storing remaining hardwoods and all conifers. The temperature of the cooler is 34 degrees and the relative humidity is 100%.

The majority of our tree sales are to small rural landowners; average order size is about 500 seedlings. Cooperators will receive their seedlings packages either through the United Parcel Service (UPS), or by picking them up at the nursery. Friday is the designated pick-up day and those that are included are notified a week in advance. This method of using UPS to ship seedlings and the one designated pick-up day/week is quite effective.

For the past two seasons, with the cooperation of the Soil Conservation Service and the State Conservation Commission we have located numerous seedling distribution sites in communities statewide. By distributing the seedlings directly to the landowners from our refrigerated seedling trucks, we hope for greater out-planting survival.

Annually Forestry Division service foresters will conduct comprehensive seedling survival investigations at numerous planting sites statewide. This information will be used to help evaluate the cultural practices used for producing seedlings at the nursery. We feel these survival studies are necessary for the continued production of quality seedlings. Service foresters also assist in seed location and collection. They develop and help implement planting plans for rural landowners. Our service foresters serve as a valuable extension of the Regeneration Center.

The Forestry Division manages a genetically improved southern pine seed orchard in southeast Oklahoma. We are utilizing the advancing front concept which involves the most productive families currently available. The initial orchards were established in the mid-60's and currently coming into full production. This provides the landowners of Oklahoma with the only available local source of genetically improved loblolly and shortleaf pine seedlings which have been thoroughly field tested through progeny tests to determine the most productive sources.

These seedlings will give higher yields of high quality timber in a shorter amount of time than "woods run" seedlings. The Division is a member of Western Gulf Forest Tree Improvement Program (WGFTIP). This is a cooperative whose members include other state and private organizations interested in the genetic improvement of forest trees. Currently 100% of all shortleaf and loblolly pine distributed by the Division is genetically improved. Through

continued research and testing with WGFTIP and Oklahoma State University, the Oklahoma Forestry Division will continue to provide the very best planting material available to the landowners of Oklahoma.

Through proper soil management, timely and appropriate cultural practices and quality control, we are ensuring the continued production of quality tree and shrub seedlings for conservation plantings in Oklahoma.