



4-H Forestry Projects

Leader's Guide to Tree Planting Projects

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Virginia Cooperative Extension

Knowledge for the Commonwealth



VIRGINIA STATE UNIVERSITY

Overview

The Virginia Department of Forestry (DOF) and the Virginia 4-H program provide free pine seedlings and hardwood seedlings at low cost to 4-H members. This Project Leader's Guide is intended for adults who are working with youth on tree planting projects. You can receive free and low-cost seedlings from the Virginia Department of Forestry. Leaders should also obtain a copy of 4-H Forestry Projects Book Two: Tree Planting Project Book, VCE publication 420-025.

Why Plant Trees?

Tree planting is something positive a young person can do for the environment. It also makes good economic sense since trees provide jobs, add value to property, and protect and enhance the environment. In most cases, planting trees is also an unselfish act since the benefits will mostly be enjoyed by future generations.

Why Seedlings?

There are several ways to plant trees. One is to grow them from seeds, but most tree seeds have long dormant periods (up to 3 years) before germinating. Unless you know what you are doing, this is usually impractical. Likewise, large "balled-in-burlap" trees are expensive and are impractical for large-scale youth planting projects. **Our recommendation is to plant bare-root seedlings provided by the Virginia Department of Forestry.** These trees are usually 1 to 2 years old and will be anywhere from 1 to 3 feet tall at planting time. They normally come packed in bundles of 25 to 50. The Virginia Department of Forestry provides up to 100 pine seedlings free and hardwood seedlings at low cost to 4-H members.

4-H Club Leaders

4-H club leaders work with youth in a specific 4-H club or school group. A tree-planting project leader is responsible for informing the youth and their parents of tree planting opportunities and forwarding seedling orders to the Extension agent or countywide project leader by January 10.

Extension Agents or Countywide 4-H Project Leaders

Extension agents or countywide 4-H project leaders work with youth and their leaders across the entire county. They are responsible for consolidating all the orders from the county and forwarding them to the appropriate person by January 15.

Ordering Pine Seedlings

Pine seedlings are grown at the Garland Gray Forestry Center in Southampton County. To receive free loblolly and white pine seedlings, distribute the 4-H Pine Seedling Order for Virginia Department of Forestry Trees form in the back of this book. All pine seedling orders must be consolidated for the county and one request made to the county forester by January 15. Provide the date that you need the seedlings. The forester will deliver the seedlings to you on that date. Information about nurseries and a county directory of foresters can be found at <http://www.dof.virginia.gov/index.html>.

Ordering Hardwood Seedlings

Hardwood seedlings are grown at the Augusta Forestry Center in Augusta County. These seedlings must be purchased on-line using the Department of Forestry website, <http://www.dof.virginia.gov/index.html>, or you can request a seedling catalog from your county forester. Seedlings will be shipped to you via UPS within three days of your requested date. Seedlings are sold by species (e.g. white oak, red oak) and large orders are sold at a reduced rate. Check with your Extension agent before ordering hardwood trees — there may be a specially funded project in your area, such as riparian restoration, that qualifies for free seedlings.

American Chestnut Seedlings

The American chestnut was once dominant in western Virginia but was killed by a disease in the 1930s. Though it is still susceptible, there is an effort underway to restore the tree. A limited number of American chestnut seedlings are available to groups that will report survival on a yearly basis to scientists at Virginia Tech. Contact Jeff Kirwan, jkirwan@vt.edu, for more information.

What To Do When Your Seedlings Arrive

Seedlings will arrive in large boxes that contain multiple bundles of 25 to 50 seedlings. Ideally, they will arrive at a location where you can immediately put them in cold storage (walk-in refrigerator) until the planting day. If not, store seedlings in an unheated basement or crawlspace. Do not let the roots freeze. Keep seedlings in the box and periodically inspect to make sure the roots are moist. Sprinkle with water if necessary. Do not expose seedlings to sunlight or wind.

Planting Day

Remove seedlings from the box and rebundle as necessary. Do this in a cold or cool room. Wrap the roots in a moist paper towel and place in a plastic bag. Take the seedlings to the desired location or have them picked up, as arrangements dictate. Do not expose them to sun or wind. If you are distributing individual seedlings to school groups, make sure you have a plastic bag for each student, and have informed the teacher that he/she will need to have students wrap individual seedlings in a moist paper towel and place it in a plastic bag prior to going home. This is best done at the end of the school day. Attach planting instructions.

Other Good Ideas for School Groups

Provide brightly colored flagging tape so that students can attach a piece to their seedling. This will reduce the chance that it will be mowed. Ask your local newspaper to donate plastic bags. Write the name of the species on an address label and attach it to the seedling. One month after planting, ask teachers to conduct a seedling survival survey, which can be done by taking a simple show of hands. Compare survival between groups and between years. Use this information to make and test hypotheses.

Arbor Day Committees

Tree planting requires careful preparation. If you are organizing a countywide effort for the first time, consider forming an Arbor Day Committee to help you distribute seedlings on a specific date of your choice. Although Arbor Day in Virginia is celebrated on the second Friday in April, any date between mid-March and April 30 will work. Arbor Day Committees need to meet only once or twice to plan and evaluate — but all hands need to be present on the day that trees are to be distributed to schools and/or community groups.

Suggested Dates

October — contact Arbor Day Committee, establish planting date

November/December — distribute seedling order forms

January — order seedlings by January 15

March 15 to April 30 — plant seedlings

May/June — conduct seedling survival survey

Tree Planting Projects and the Virginia Standards of Learning

Science

Scientific Reasoning (Science 4.1, 6.1, LS.1, ES.1, BIO.1)

Tree planting success depends on many factors (independent variables) such as the date planted and the amount of rainfall after planting. Conduct a survey one month after planting to see how many seedlings are still surviving. This data can be entered on the <http://www.watersheded.org> database, and compared with other planting efforts around the state. Tables and graphs are presented for student interpretation, hypothesis testing, and conclusions.

Life Processes (Science 4.4, LS.4, LS.11)

Seedlings need to be planted while they are still dormant. We do not want trees to grow before they are in the soil. That is why we keep them in cold storage until planting. Students can watch for the first signs that dormancy has broken in their newly planted seedlings. To properly plant a seedling, a student must recognize where stem, roots, and leaves are positioned.

Resources (Science 4.8, 6.9, LS.12, ES.7, ES.9, BIO.9)

Trees are renewable, which means they can be replaced with proper management. Planting trees is one form of management. It speeds up the process of succession, and allows people to influence the type of species that dominate a future forest ecosystem. Trees also protect our water supply by filtering out pollutants and preventing flooding. Satellite photographs will illustrate how many municipal water supplies are often located in or near forested areas.

Math

Number and Number Sense (4.2, 5.1, 6.1, 6.4)

Have students report how many trees are surviving after one month and express the number as a fraction of the total planted. This is a measure of seedling survival, which is also expressed as a percentage. This information can be entered on the <http://www.watersheded.org> database and compared with other planting efforts around the state.

Measurement (4.11, 5.11, 6.9, 7.1)

Seedling height is one way to determine how well a seedling is growing. Have students measure height at the end of a growing season to see which ones are the most vigorous.

Geometry (4.15, 4.16)

Seedlings are often planted in parallel rows with 10-foot spacing. Have students draw a map of their planting area to determine the number of seedlings they need.

Probability and Statistics (4.19, 4.20, 5.17, 5.18, 5.19, 6.18, 6.19, 7.17)

Students can look at the results of past planting efforts by observing the data tables and graphs on <http://www.watersheded.org>. Use this information to predict the outcomes of this year's planting project.

Patterns, Functions and Algebra (5.21, 6.23, 7.22)

Have students set a goal for how many trees they want to grow, then use past survival data to determine how many they need to plant (allowing for some seedling mortality). The algebraic equation will be $x = yz$ where x = the number of seedlings they want to grow, y = expected survival rate, and z = the number needed to plant.

Virginia Studies - History

Virginia and Its First Inhabitants (VS.2)

American Indians used trees for many purposes. Hickory, oak, and chestnut trees were valued for food. The word, "hickory" is actually an Algonquin word that we still use today. The bark of other trees, such as elm and yellow-poplar, were used for fiber and to cover lodges and longhouses. Pine and yellow-poplar were used for canoes.

Colonization and Conflict (VS.3)

Colonists had other uses for trees. In fact, Virginia was established in part to secure a supply of wood and resin needed for boat building. Live oak was prized for its wood and longleaf pine was prized for its resin (used to seal boats to prevent leakage). Both trees are found south of the James River in Tidewater Virginia. Sassafras was an important early export, before tobacco.

Civil War and Post-War Eras (VS.7)

The height of deforestation in Virginia probably occurred around the time of the Civil War. This coincided with land clearing for agriculture. In the post-war era much of this agricultural land was abandoned and came back as forest (forest succession). Today 63 percent of Virginia is forested, more than at the time of the Civil War.

Virginia 1900 to the Present

Virginia's forests and forest products represent the state's number one manufacturing employer, contributing over \$11.5 billion to the economy. Most of Virginia's paper industry is located in the Coastal Plain and Piedmont regions, where the supply of yellow pine is the greatest. Yellow pine fibers provide strength to paper. Some of our finest hardwoods are grown in the Blue Ridge and Valley and Ridge provinces, especially where soil conditions are favorable for rapid growth. This is where our furniture and cabinet industries are located. Because we are close to port cities like Hampton Roads and Baltimore, we are a leading exporter of fine hardwoods.

Virginia's Natural Resources (Science 4.8)

Definition: A natural resource is something that comes from nature that is useful to man.

What are some types of natural resources?

1. Water
2. Animals and plants, both domestic and wild
3. Minerals, rocks, and ores
4. Energy sources (wind, water, and fossil fuels)
5. Forests, soils, and land

Forests Are a *Renewable* Natural Resource

Fossil fuels are non-renewable — once they are used up they are gone

Trees, water, and sun are renewable — with proper management they can be used forever

Quick Facts about Virginia's Forests

1. Virginia is 63 percent forested.
2. Private landowners own 74 percent of this forestland.
3. Virginia forests contribute \$11.5 billion to the economy each year!
4. Virginia forests provide more manufacturing jobs than any other enterprise in Virginia.
5. The annual growth of Virginia trees exceeds the harvest.
6. Trees produce oxygen when they are alive and growing, but they produce carbon dioxide when they die and decompose. Harvesting mature trees and substituting forest products for other materials is one way to keep our atmosphere healthy.

Forests, Soils, and Land

Trees, like most plants, prefer soil that is deep, moist, and has a mixture of sand, silt, and clay. However, many of the very best soils in Virginia have been converted to agriculture or uses other than forestry. On the coastal plain you are most likely to see forests growing on land that is too wet (at least seasonally) for farming. On the piedmont, forests tend to grow on land that was formerly farmed but has badly eroded. In the Blue Ridge, Ridge and Valley, and Appalachian plateau regions, forests most often occur on land that is too steep or too rocky to farm.

Forest Communities

Forest communities are places where certain types of plants and animals are found living together. They are usually named for the dominant trees.

Oak-Hickory Forest is the most common forest community in Virginia, regardless of where you live — Coastal Plain, Piedmont, Ridge and Valley, or Appalachian plateau.

Pine and Oak-Pine Forests are the second and third most common communities, and occur mostly on the Coastal Plain and Piedmont.

Oak-Gum Forest is the fourth most common community, and occurs mostly on the coastal plain.

Important Virginia Forest Products

Softwood lumber (for home construction)

Hardwood lumber (for flooring and manufacturing)

Furniture and furniture parts

Cabinets and millwork

Oriented strand board (OSB)

Pallets

Posts and poles

Copy paper

Paperboard (baseball cards, food containers)

Newsprint

Cardboard boxes

Fragrances

Christmas trees

Clean air and water

Beautiful communities

Habitat for wildlife

For more information

4-H Natural Resources and Environmental Education

<http://www.ext.vt.edu/resources/4h/eenr.html>

Virginia Project Learning Tree (PLT)

<http://www.cnr.vt.edu/plt/>

Virginia's Soil and Water Conservation Districts and Programs

<http://www.dcr.virginia.gov/sw/>

Virginia Department of Forestry

<http://www.dof.virginia.gov/index.html>



How to Plant and Care for a Seedling

Step 1. Keep roots cool and moist until planting. For individual seedlings, wrapping the roots in a moist paper towel and inserting them into a plastic bag (roots only) will help. Store seedlings in an unheated basement or refrigerator. Do not let the roots freeze.

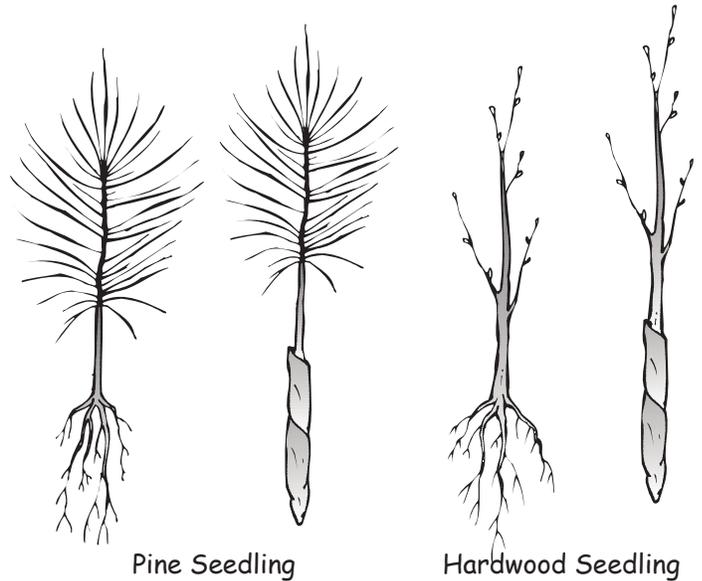


Figure 1. Keeps roots cool and moist until planting.

Step 2. Find a spot with plenty of sun that is away from your house and not under electric or phone wires. Clear all grass within 3 feet of the seedling. (Young trees do not like to grow in the grass.) Dig a hole slightly deeper than the roots so that they do not bend in the planting hole. Do not plant the seedling any deeper than the first green needles or bud.

Step 3. Put some garden mulch, pine straw, or leaves in the 3-foot area around the tree to keep the grass from growing back. Mark your tree with a flag or small stake so that a lawn mower does not cut it. (Young trees are hard to see.) Give your tree water when it gets hot and dry outside.

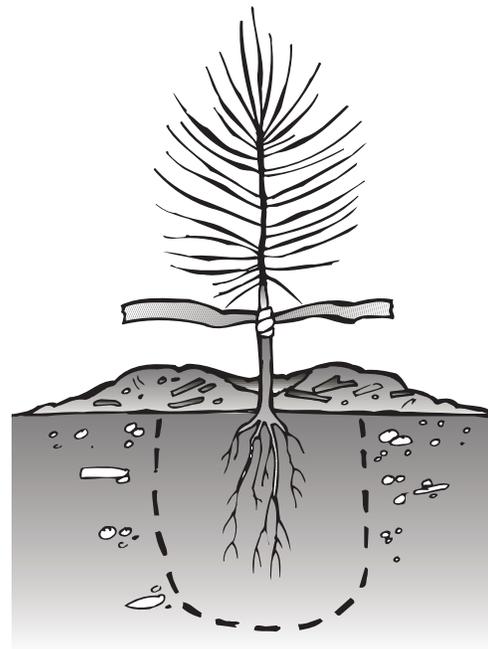


Figure 3.

Note: Your seedling will grow slowly the first year. Do not plant seedlings closer than 10 feet to each other.

Facts About Your Seedling

Your seedling was grown from a seed planted at a nursery and grown for a year or two before it was taken out of the ground and shipped to you. Trees provide many benefits. Here are just a few.

Trees and Forests Protect the Watershed

Protect soil from eroding
Prevent nutrients from entering a stream
Help prevent flooding by absorbing more rainfall

Know Your Watershed

A watershed is the land area that drains into a body of water, such as the Chesapeake Bay, Potomac River or nearby creek. Sixty percent of the Chesapeake Bay Watershed is forested. Nearly 30 percent is agriculture, and 4 percent is developed for homes and communities. Forestland is the best at protecting water quality. Nearly all of the Chesapeake Bay Watershed would be forest if people had not changed things.

Other Benefits and Facts

Trees are a renewable resource. Wood is recyclable and biodegradable.

Products made from steel, glass, plastic, concrete, or brick require approximately 12, 14, 6, and 4.5 times more energy, respectively, than do products from wood.

One mature tree absorbs approximately 13 pounds of carbon dioxide per year. When a tree dies, it releases its stored carbon back into the air.

Trees lower air temperatures by evaporating water from their leaves. Three well-placed mature trees around a house can reduce air-conditioning costs 10 percent to 50 percent.

A 1980 study showed that trees add 6 percent to property value.

Trees provide food and shelter for wildlife. Many species use dead trees for homes.

Top 10 Virginia Trees

White oaks
Yellow pines (includes loblolly)
Red oaks (includes pin, willow, water oaks)
Tulip tree (yellow poplar)
Maples
Hickories
Sweet gum
White pine
Beech
Tupelo (includes black gum)

4-H Pine Seedling Order for Virginia Department of Forestry Trees

COUNTY: _____ DATE: _____

NAME: _____ PHONE: _____

ADDRESS: _____

SCHOOL: _____

TEACHER: _____ GRADE IN SCHOOL: _____

Indicate the type of pine and enter number of seedling bundles needed for your area.

Number of Bundles	No. Seedlings in Bundle	White Pine	Loblolly Pine
	25		
	50		
	100		

Since weather conditions control digging nursery trees, delivery cannot be guaranteed for a certain date, but will be made as close as possible to the last two weeks of March. Pine seedlings are 6 to 12 inches in height.

LANDOWNERSHIP:

- _____ Private Farm
- _____ Other Private (home, church, etc.)
- _____ Public Area (park, school, etc.)
- _____ Forest Products
- _____ Christmas Trees
- _____ Home or Community Beautification

PURPOSE OF PLANTING:

- _____ Educational
- _____ Erosion Control/Water Quality
- _____ Other _____

I have read the regulations on the front and back of this form governing the sale of tree seedlings for forest planting sold by the Department of Forestry, Virginia Department of Conservation and Economic Development. I place my order for tree seedlings and agree to plant and grow said seedlings subject to the aforesaid regulations of the department.

Signature of Parent or Guardian

The Virginia Department of Forestry assumes no responsibility or liability for planting of any tree seedlings and in the sale thereof makes no warranties, expressed or implied, or merchantability or of fitness for a particular purpose and makes no warranties regarding the survival or rate of growth of any seedlings.

Enabling Legislation: Title 10, Chapter 1, Section 10 12.1 of the Virginia Code. As a direct means of re-establishing forests on lands in Virginia, the Department of Forestry, hereafter referred to as the Department, grows tree seedlings for sale at cost to private and public landowners for foresting lands in Virginia.

Where to Get More Seedlings

The Virginia Department of Forestry (VDOF) publishes a tree seedling catalog for Virginia landowners. The catalog, *Virginia Trees for Virginia's Forests*, includes more than 40 species of seedlings that have been grown at one of three State Forestry Centers. In addition to a wide selection of bare-root seedlings, the VDOF offers landowners six different specialty packs and eight seed mixtures suitable for various wildlife habitats, screening, use in wetland areas, and for erosion control. To receive a copy of the catalog, contact your local VDOF office, listed as "Virginia, Commonwealth of: Forestry Department" in the blue pages of your telephone directory. All orders made from this catalog will come from the **Augusta Forestry Center (AFC), PO Box 160, Crimora, VA 24431**, via United Parcel Service delivery. If you have questions, call (540) 363-7000. Seedlings may also be ordered using the on-line seedling catalog available at <http://www.dof.virginia.gov/index.html>.

Call on any VDOF employee for assistance in planning your reforestation. Seedlings required for various spacings are given below.

Spacing (feet)	Trees per Acre
9 x 9	538
10 x 10	436
6 x 7	1037
6 x 8	908
6 $\frac{1}{2}$ x 6 $\frac{1}{2}$	1210
7 x 7	889
7 x 8	778
8 x 8	680

Sample Letter

Dear 4-H Parent or Guardian:

Your 4-H'er is interested in the 4-H Pine Seedling Project. For this project, he or she may receive free from the Virginia Department of Forestry 25, 50, or 100 pine seedlings for planting. We believe that much will be learned from this project and that you as well as your 4-H'er will enjoy watching the trees grow in size and value. Full instructions are in *Pine Seedlings*, Virginia Cooperative Extension publication 420-069, and **4-H Forestry Projects Book Two: Tree Planting Project Book**, Virginia Cooperative Extension publication 420-025.

Please follow these recommendations for a successful planting project:

1. Select a good planting area. Seedlings may be planted on cutover land or open land not suitable for crops or pasture. Seedlings should not be planted in the woods or areas that are heavily shaded.
2. Plant only where the seedlings will be protected from grazing.
3. Help your 4-H member follow the planting instructions available with this project. If seedlings are being grown for Christmas trees remember that they will need annual mowing and/or spraying.

Please go over the attached form and help your son or daughter fill out the seedling order. Check to see that the order blank is correctly filled out. **Your signature** must be at the bottom of the form.

We appreciate your help and interest in this 4-H club project and look forward to watching your seedlings grow.

Sincerely,

www.ext.vt.edu

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