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EC17-11-80 Nebraska Outdoor Education Series: Plant a Tree

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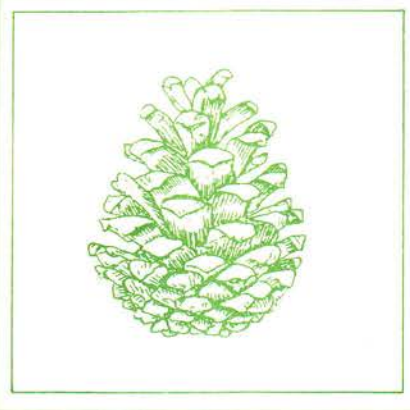
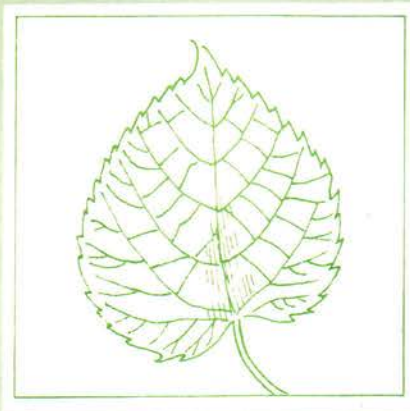
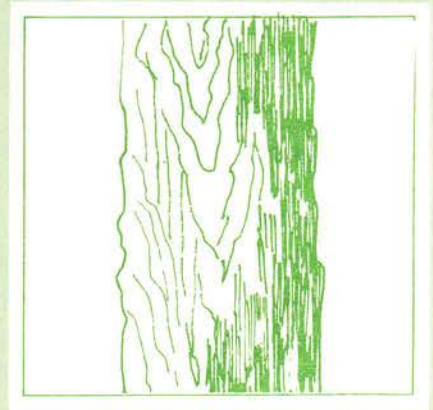
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NEBRASKA

OUT
EDUCATION
O O
SERIES



Plant a Tree



Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Leo E. Lucas, Director of Cooperative Extension Service, University of Nebraska, Institute of Agriculture and Natural Resources.



Note to Parents

This Plant-A-Tree project is intended to allow a youth to become a part of a Nebraska tradition...tree planting.

Not all trees or shrubs can find a home in your yard or apartment. Help your child to discover a home for the tree or shrub he or she grows or receives.

Discuss, observe, and help in any way possible to show the relationship of trees and shrubs to people, birds, squirrels, rabbits, and other wildlife.

Perhaps the greatest benefit of this project is being close to a living plant. This project will:

1. Introduce you to five tree planters—one from each area of Nebraska.
2. Discuss the parts of tree seeds.
3. Give examples of how tree seeds travel.
4. Discuss preparation of soil.
5. Demonstrate how to grow a seedling tree from seed.
6. Demonstrate how to transplant a tree.
7. Offer suggestions for activities and exhibits.

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Acknowledgment

Students and faculty at the University of Nebraska have researched, written, and acted as reviewers for this project. Our special thanks to Jim Brockman, General Agriculture major, University of Nebraska from Dannebrog, Nebraska, for his major contribution.

Plant A Tree

Joe Range, Extension Forester
John D. Orr, Extension Specialist, 4-H Youth Development

Tree Planter State

When the first settlers arrived, Nebraska had few trees. Prairie grass fires started by lightning and pushed by strong Nebraska winds would burn for miles. Grass would grow again but trees could compete with grass only in wet places protected from fire. The only trees were found on the banks of creeks and rivers.

Pioneer explorers, farmers, ranchers and railroad engineers needed wood but found very little for building, cooking, or heating.

As a result the early pioneers planted trees. This practice was continued by their children and their children's children. Since Nebraska people have such a strong tradition for planting trees, Nebraska has become known as the "Tree Planter State".

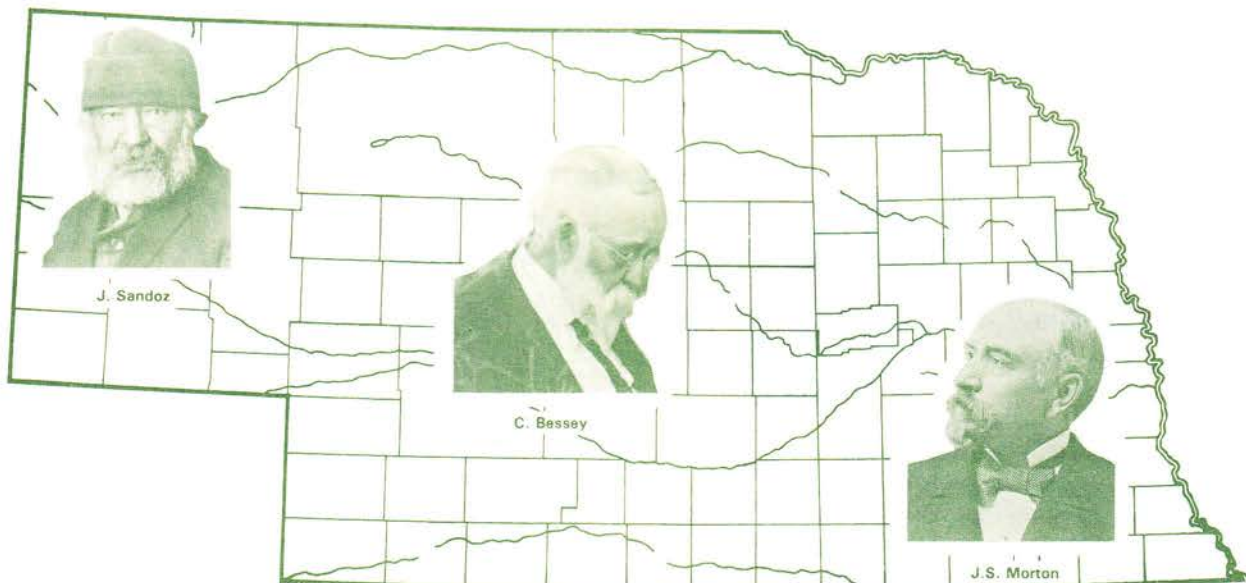
Some of the well known "Tree Planters" of Nebraska are Jules Sandoz, Dr. Charles Edwin Bessey, Wesley Huenefeld, J. J. Lydick and J. Sterling Morton.

Jules Sandoz ("Old Jules" in the biography written by his daughter, Marie Sandoz) not only planted

trees on the treeless plains, but also gave away roots from his trees to anyone who had the same desire to plant trees. Jules Sandoz pioneered in Northwest Nebraska near Rushville.

Dr. Charles Edwin Bessey, while teaching at Michigan State College, saw pine trees growing in the sandy soil of that state. When he came to the University of Nebraska to teach botany and horticulture, he saw few trees growing in the Sandhills. Dr. Bessey did not have instant success in his plantings, but today two National Forests are a credit to his insight and fortitude. The largest of the two is the Samuel R. McKelvie National Forest located in Cherry County, consisting of 110,000 acres, (11,050 acres in forest). The second is called the Bessey Division of the Nebraska National Forest near Halsey, Nebraska, consisting of 96,000 acres, 22,180 acres planted to trees. The forest near Halsey is the only completely man made forest in the United States.

A modern day "Tree Planter" is Wesley Huenefeld who lives near Aurora, Nebraska. Mr. Huenefeld



lives on a full section of land, 640 acres, completely surrounded by trees which were mostly planted by him. The Huenefeld farm was designated a "Tree Farm" in the American Tree Farm System in 1959.

J. J. Lydick owned a 240-acre farm near Craig in Burt County called "Levelgreen Farm". Lydick planted the first trees on his farm in 1912. During the drought years of 1934 and 1936, Lydick's trees helped save his corn crop, while his neighbors' fields were being burnt up by the hot, dry winds. During this same period, his orchards produced an abundance of fruit.

In 1933, many of Lydick's trees were transplanted to the State Capitol grounds. Forty four concolor firs, 25 feet high, were moved from one of his windbreaks to Lincoln. Mr. Lydick has also received national recognition for his many different specimen trees and for the beauty and symmetry of his windbreaks.

Arbor Day is an official state holiday in Nebraska and is observed nation wide. Arbor Day was founded by J. Sterling Morton of Nebraska City. In 1872, Morton suggested that the 10th day of April be

designated Arbor Day to encourage tree planting in Nebraska. Over a million trees were planted that first Arbor Day. The date of Arbor Day was later changed to April 22, Morton's birthday. A lasting memorial to J. Sterling Morton is Arbor Lodge near Nebraska City where many trees planted by Morton can be viewed.

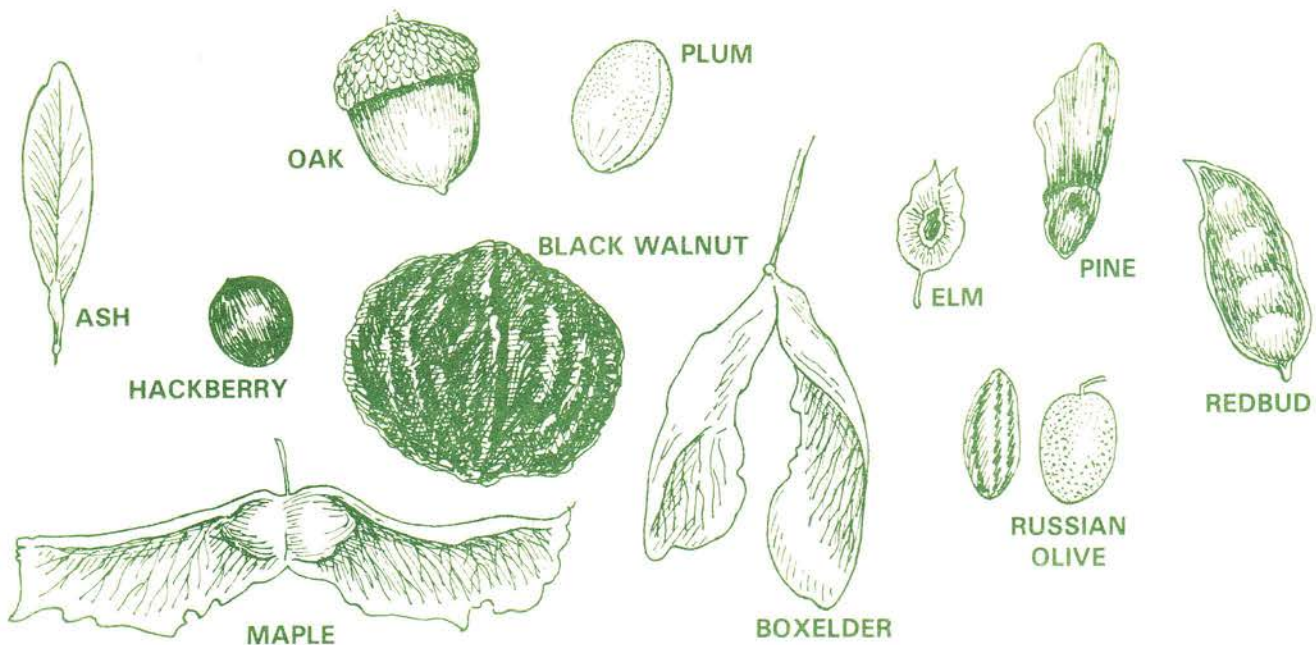
Activities

The following activities are intended to help you:

1. Gain a sense of responsibility toward other living things and to improve your understanding of the environment.
2. Begin to understand how environmental factors such as light, water, soil, and temperature affect plant growth.
3. Explore career possibilities involved with growing plants.
4. Learn proper methods of selecting and growing seeds.

Activity 1. Collecting Seeds

There are many sizes and shapes of tree seeds (*Figure 1*). Every seed is a tiny package of food with a speck of sleeping plant at one end. When the seed is warm and moist, a tiny root, the hypocotyl and radical, from the seed reaches down into the earth and a stem, the cotyledon, shoots up toward the sun. The young tree lives on the food in the seed until it has grown its first leaves.



Just as the size and shape of seeds are different for different trees, so the parts of seeds may be different. Tree seeds ripen at different times (Table 1).

Table 1. Time of year tree seeds ripen.

	<i>May</i>	<i>July</i>	<i>August</i>	<i>September</i>	<i>October</i>
Spring	Elm Willow Soft Maple Cottonwood				
Summer		Redbud	Basswood Black Cherry Boxelder		
Fall				Ash Hard Maple Red Oak White Oak Black Locust Hackberry Ironwood	Hickory Pine Buckeye Coffee Tree Honey Locust Red Cedar Sycamore Walnut

Exhibit: Collection of Tree Seeds

Your County Fair may have an exhibit called "Nebraska Tree Seed Collections."

Display seed in jars or glass bottles, such as baby food jars or pint canning jars with lids (no size is specified, but all jars should be the same size and style).

Put one species of tree seed in each jar. Have a collection of as many seeds as possible. Ten jars of seeds are the minimum. Your exhibit will need the following information on each jar:

1. Your name.
2. Your address.

3. Name of tree seed (common and scientific).
4. Date tree seed collected.
5. County where tree seed was found in Nebraska.

Judging Pointers

1. Jars - are jars clean and of uniform size? Can you see seeds through the glass?
2. Information - is information correct, complete and neatly written or printed? NOTE: This information may also be typed.
3. Seeds - are seeds clean and dry?
4. Collection - do you have 10 jars of seeds? (Minimum)

Activity 2. How Tree Seeds Travel

Have you seen a lone tree standing by itself in the middle of an open field? Did you ever wonder how that tree got started or how trees growing along a river or fence got started? Assume that man didn't plant them. How then, did they get there?

1. *Winged or Plumed Seeds + Wind.* Some seeds depend on wind for dispersal. They have special parts or shapes that help them fly. An example is the cottonwood seed. Some have single wings such as ash seed, while others are fused winged such as the boxelder or maple seeds. The single wing is more common, but the fused wing is more effective for slowing down the seed as it falls allowing the wind to carry it to its new location. Wind is involved with the dispersal of nearly all seeds. With Nebraska winds sometimes reaching more than 60 miles an hour, tree seeds can travel a long way.

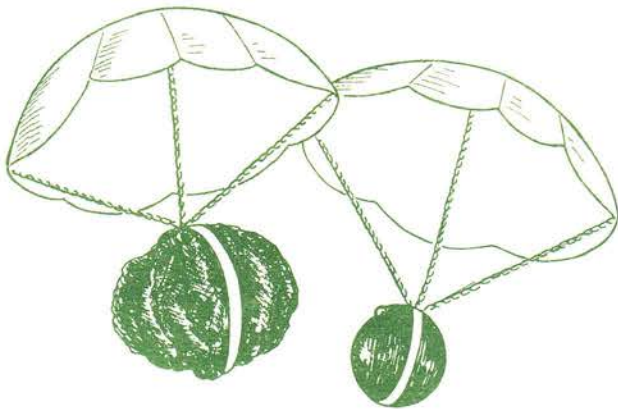
2. *Hitch-hike - Hoarding.* Squirrels might gather nuts in the fall, bury them and then forget where the nuts are buried. These nuts will probably grow the following spring if they aren't disturbed. Many oak trees are started in this manner. Mice collect mostly small seed. Birds sometimes store acorns and seeds.

Birds often carry fruits such as plums or cherries to a perch in a tree where they can eat unbothered. They eat the fruit and discard the seed.

Birds also disperse seeds by eating the whole fruit or berry. The hard seed is passed, unharmed, through the digestive tract of the bird. Red Cedar, Blackberries, American Elder, Black Cherries and many other seeds are distributed in this way.



3. *Gravity.* When you throw a ball in the air, it comes down because of gravity. Tree seeds also fall to the ground because of gravity. Walnuts, acorns and apples make use of gravity as a means of dispersal. The force of gravity is put to much better use if a hill is near for the fruit or nut to roll down. Examples of seeds using gravity to travel may include: Ohio Buckeye, Kentucky Coffee Tree, Walnut, and Oak.

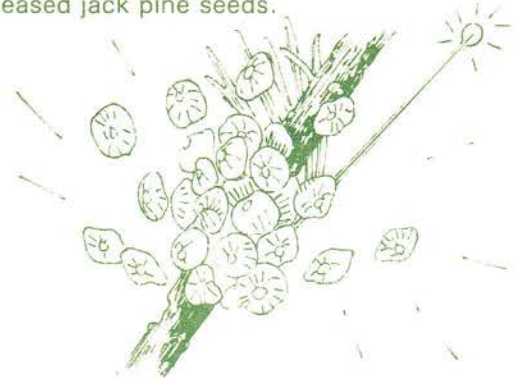


4. *Water.* A mother tree growing near a stream will drop its seeds into the stream. The running water will carry the seed downstream until it gets

caught along the stream bank, or is removed in another way. Cottonwoods, birch, and willows are examples of this type of dispersal.



5. *Fire.* Fire is the unusual method used by jack pines for scattering seeds. The cone of the jack pine will not open to release seed unless a high temperature around 140° (60°C) is reached. When a fire does start and seeds are released, the charred ground below makes an excellent seedbed for the newly released jack pine seeds.



6. *Man.* Man also gets credit for many of the trees dotting our state. He has planted an extra two million trees each year through planting seeds and seedlings. Man and nature working together have provided a beautiful state.

Many of the trees growing in Nebraska come from other nations. Some examples are: Siberian Elm, Chinese Elm, Ginko, Japanese Lilac Tree, Russian Olive, Scotch Pine, and Austrian Pine.

Exhibit: How Tree Seeds Travel

Your County Fair may have an exhibit called "How Tree Seeds Travel."

A tree seed travel display can be made of plywood panel or tagboard with a maximum size of 28" wide x 32" long (71-81 cm), but may be smaller. The display should have six squares of equal size. Three

squares wide and three squares high. Each square must show one of the methods mentioned in this manual.

Your exhibit will need the following information on the back of the display:

1. Your name.
2. Your address.
3. Your telephone number.

Each square should have the following information:

1. Way tree seed travels.
2. Seed.
3. Name of tree (common and scientific).
4. Date collected.
5. How far from nearest seed tree.
6. County found in Nebraska.

Judging Pointers

1. Method seed travels. Try to place seeds in logical categories. Example: Walnuts do not have wings and usually aren't blown very far by the wind.

2. Date collected. Your answer should be considered as correct by the judging committee.

3. Neatness. Are your squares uniform in size? Is your workmanship neat? Is there evidence of creativeness?

4. Name of tree. Seeds should be correctly identified (common and scientific name).

5. Seed. Your seed should be dry, clean, and complete. The seed can be displayed using a clear plastic bag. Glue or wire may also be used to hang seed on board.

Activity 3. Trees from Seeds

Collecting Your Tree Seed

Perhaps you will be given the tree seeds for your experiment in growing a tree. If not, then look for your own tree seeds to plant. Refer back to *Table 1* for times tree seeds ripen.

Collect fruits when they are ripe. Indication of ripeness are opening of cones, dropping of fruit, color change from green, white, etc., to another color.

Selecting the Container

As you select the container in which to grow your tree from seed consider:

Size. The container should be large enough so that the roots will have room to grow. Look for a container that is at least four inches across and four inches deep.

Material. The container may be made of clay, moisture resistant paper, ceramic, metal, or any other material readily available. You may buy the container.

Drainage. There should be a hole in the bottom of the container to allow drainage of excess water.

Appearance of Container. Keep the container clean. A dish or plate under the container will protect furniture from water stains and also collect excess water from drainage.

Make Your Own Container-(Optional) You can make a low cost container. You will need a half gallon milk carton, a number 303 tin can, gravel or sand, hammer and nails, and garden soil.

Use a can opener to remove the top lid from a 303 tin can. Turn the can upside down. Use a hammer and a 16-penny nail to open seven holes around the bottom of the can.

Find an empty half gallon milk carton. Draw a line around the carton five inches (12.7 cm) from the bottom of the carton. Cut along the line. The top is now off the carton. Decorate the milk carton. Pour one cup of sand or gravel in the bottom of the milk carton.

Place the number 303 can in the milk carton. The carton will prevent water from running from the tin can onto a table.

The Soil

The best growing medium for starting seeds is one of the commercially available soilless mixes. You can buy a ready mixed medium or the ingredients to make a soilless mix.

A satisfactory growing medium should have an adequate water holding capacity and allow for proper drainage. The growth medium should be free of diseases, chemicals, and other toxic residues.

You may not want to buy your soil. Good garden soil might work just as well.

There is a problem in using garden soil. The soil may have diseases present. You can do several things to minimize this problem:

1. Sterilize the soil by heating the soil to 160° (71 °C) for at least 30 minutes.
2. Water with a fungicide solution. Your County Extension Agent or garden store can recommend the proper fungicide and mixture.

Fill the Container with Soil

It works best if you put marbles or gravel in the bottom one inch (2.5 cm) of the container. Fill the container with your choice of soil or purchased material.

Optional. (If you are using a number 303 can and milk carton.)

Place about one inch (2.5 cm) of gravel, sand, or marbles in the bottom of the milk carton. This will allow the excess water to drain out of the can. Place number 303 can in milk carton.

Growing Your Tree

Your tree will depend on you until you transplant it outside. Your tree must have the proper amount of

water, sunshine, air, space, and temperature. Compare trees grown in darkness and light. Compare trees watered regularly with some not watered for at least a week.

Exhibiting Your Tree

Your County Fair may have an exhibit called "4-H Trees from Seed." You may contact your County Agent for information on how to enter your tree. Each exhibit will need the following information:

1. Your name.
 2. Your address.
 3. Your telephone number.
 4. Date tree seed planted.
 5. Species of tree (common and scientific name).
- A brief description of an adult tree of the species you have planted (height, diameter, leaves, branches, etc.) and the uses in Nebraska.

Judging Pointers

Your exhibit may be judged on the following points:

1. Does the exhibit story include your name, the date the seeds were planted, species of tree, uses in Nebraska, description of an adult tree including height, diameter of tree trunk and some ways to identify the tree?
2. Is the container clean and neat? Does the container allow proper drainage? Does the container detract from the total exhibit?
3. If the container has been turned regularly, the tree will grow straight. Light, temperature, and disease will affect the color of the tree. Different varieties of trees will grow at different rates of growth.

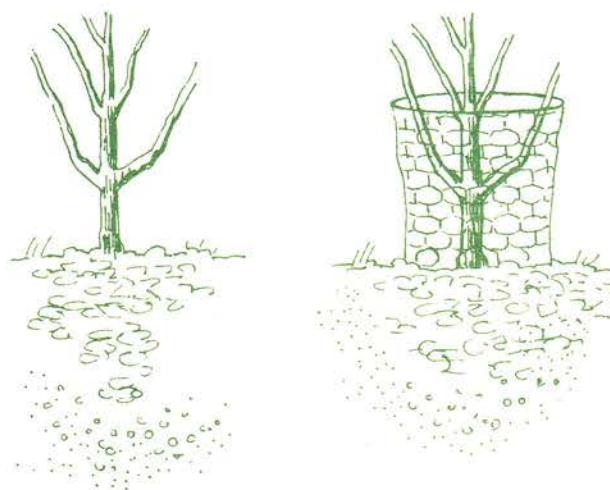
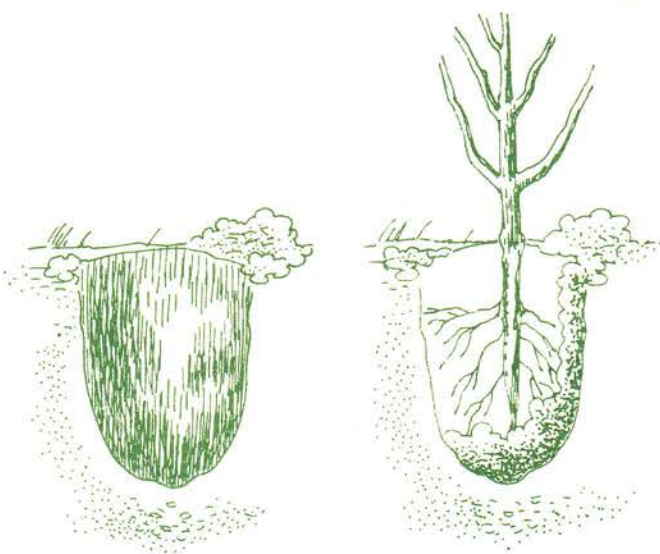
Activity 4. Plant Seedlings

The success of the tree planting depends on:

1. How the planting site is prepared.
2. How the plants are handled and planted.
3. How the trees are cared for after planting.

Preparing the Site

Make the hole or opening large enough to receive the entire root system without crowding or bending. A shallow hole that causes roots to be turned up at the bottom may result in the death of the tree.



Handling the Plants and Planting

Keep roots moist at all times, but do not leave unplanted seedlings in water over night. Be sure bare roots are not exposed to air for more than the time necessary to transfer plants from container to hole.

Plant each tree the same depth it stood in the nursery bed or container. Make sure tree stands straight.

Pack soil firmly around roots and tamp to remove all air pockets. Do not place sod and trash in contact with roots.

Cover planting spot with loose soil to serve as a mulch.

As a general rule it is best in Nebraska to plant in early spring (April 1 - May 15).

Caring for the Trees

Help your trees fight for survival against drought, weeds, insects and animals by giving them the best care and protection. Visit your trees often, year round.

Protect from livestock and animals. Animals can injure trees regardless of whether trees are young or old. Trees can be protected by a guard of chicken wire placed around the tree. Mice usually cause little damage if all trash is removed from the area directly around the base of the tree.

Cultivation. In all parts of the state remove grass and weeds in the area around the tree by cultivation or hoeing. In sandy soils only about one foot should be kept clean around the tree to prevent soil from blowing.

Exhibit: For Trees You Have Transplanted

Your County Fair may have an exhibit called "4-H Tree Transplanting."

Your tree transplanting display can be a plywood panel or tagboard 24" by 22" (60.9 x 55.8 cm) wide. The display should consist of pictures or drawings showing the steps in transplanting trees either by the shovel method or by machine. One picture must be of the growing tree. The display should carry full explanation or description.

Each exhibit will need the following information on the back of the display:

1. Your name.
2. Your address.
3. Your telephone number.
4. Date tree seed planted.
5. Species of tree (common and scientific name).
6. Fifty-word description of the method used to transplant tree.

Judging Pointers

1. Size. Is your exhibit the correct size?
2. Information. Have you fixed the information asked for to the back of the display?
3. Story. Does your 50-word description tell others how to transplant trees?
4. Pictures. Are your pictures or drawings clear enough to show the steps in transplanting trees?

5. Steps. Can the viewer understand how to transplant a tree from the series of pictures or drawings?
6. Is your display neat and does it show creative thinking?

There are many other 4-H projects involving trees. Your County Extension Agent has available additional 4-H members' and leaders' manuals.

Careers Unlimited

Employment opportunities are favorable for persons who have a sincere interest in plants. You may want to become a Forester or work for the Soil Conservation, Cooperative Extension Service, or Natural Resource Districts. You can work in fire control, recreation, wildlife management, tree nursery supervision, landscape design, Arboriculture, or Teaching.

You may wish to write to the Office of the Dean: College of Agriculture, Institute of Agriculture and Natural Resources, 103 Ag. Hall, East Campus, University of Nebraska-Lincoln, Nebraska 68583. Be specific as to careers you may wish to explore. Or, you may decide to write directly to the Department of Forestry, Fisheries and Wildlife, Plant Industry Building, East Campus, University of Nebraska-Lincoln, Nebraska 68583.

If your interests are in the areas of solving environmental problems, you may want to consider teaching as a career. Environmental issues almost always involves plants.

Camp counseling can be a practical introduction to careers in environmental awareness. The camp counselor can be instrumental in developing human awareness to environmental problems and environmental activities.

Life science, biology, physiology, physical science, geography, geology, vocational, and social studies teachers are concerned with our environment. Again, plants are an important part of our environment. Trees are plants!

Americans are becoming increasingly conscious of the importance and need for well-planned facilities and the landscaping of those facilities. Architects, landscape architects and urban planners all work with plants.

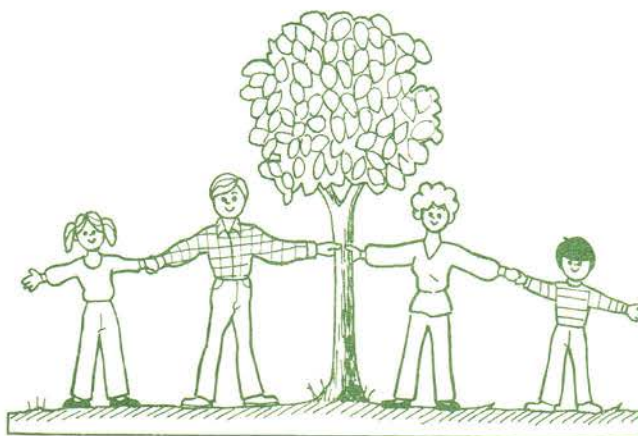
Natural resources managers are involved with plants. They analyze existing and potential problems of resource deterioration and help to solve those

problems. There are careers as fish and game wardens, foresters, oceanographers, park ranger-naturalists, range managers, soil conservationists, watershed managers, and wildlife managers.

Some occupations rely heavily on people trained as technicians, implementers, testers, and analysts. These are the people who test theories and actually implement environmental ideas into programs and projects. They also work with plants.

An example of this occupation would be the environmental inspector who is guided by the regulations set by the United States Congress.

Technicians work with engineers and scientists to help solve problems. The Federal Government employs over 80,000 technicians. Technical training colleges, vocational schools, military service training, or junior or community colleges may prepare you for these jobs. You need training in life sciences, engineering, drafting, and physical



PUT YOUR ROOTS IN NEBRASKA!

science. Examples are biological, environmental, food, health, horticulture, land-use, nuclear, physical science, and resource conservation (forest, park, recreation, wildlife, soil) technicians.

There is also a need for operators and laborers, the "muscle" behind the plans for improvement and conservation. They work with plants. Trees are plants!

Trees and Shrubs

EVERGREENS

REDCEDAR: Ideal for windward row of belt or single or double row planting. Very hardy. Drought resistant. Dense, close to ground foliage. Recommended for the eastern half of Nebraska.

ROCKY MOUNTAIN JUNIPER: Slower growing than redcedar, more compact. Retains green color year round. Somewhat less susceptible to cedar-apple rust. Recommended for the western half of Nebraska.

PONDEROSA PINE: Native. Rapid growing when well established.

AUSTRIAN PINE: Similar to Ponderosa pine. Suitable for Christmas tree.

SCOTCH PINE: Shorter needled than Austrian or Ponderosa Pine. Suitable for Christmas tree.

JACK PINE: A short needled pine. Drought tolerant when well established. Adaptability in western third of Nebraska unknown.

COLORADO BLUE SPRUCE: Slow growing, dense. Especially desirable as inside row of windbreak.

BLACK HILLS SPRUCE: Slow growing, dense. Recommended in western Nebraska for inside row of windbreak.

BROADLEAF TREES

SIBERIAN ELM: Rapid growing, drought resistant.

HACKBERRY: Native. Does best in deep, fertile soils. Growth limited on high, dry western site.

HONEYLOCUST: Thornless. Well adapted to difficult western sites.

COTTONWOOD: Fast growing on sites with ample moisture, good for quick protection.

SILVER MAPLE: Avoid dry upland sites of western Nebraska. Rapid growing.

BLACK WALNUT: Prefers fertile, well-drained soils of eastern Nebraska, and stream beds of central part of the state.

GREEN ASH: Hardy, long lived. Dense foliage. Growth limited on high, dry western sites.

SHRUBS

COTONEASTER: Wildlife and windbreak shrub. Thrives in poor and rather dry soil.

LILAC: Grows 10 to 20 feet tall. Resistant to chlorosis.

HONEYSUCKLE: Grows 10 to 12 feet tall. Excellent wildlife food.

CHOCKECHERRY: Black fruit excellent for wildlife or human consumption.

NANKING CHERRY: Recommended for eastern Nebraska. Attractive bloom and excellent fruit.

AMERICAN PLUM: Suitable for erosion control, wildlife protection.

CARDINAL AUTUMN OLIVE: Good wildlife shrub.

RUSSIAN OLIVE: Variety KINGHORN. Hardy across state. Attractive foliage, dense.

SKUNKBUSH SUMAC: Dense, hardy grows to 8 feet. Adapted to wide range of soil conditions.

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