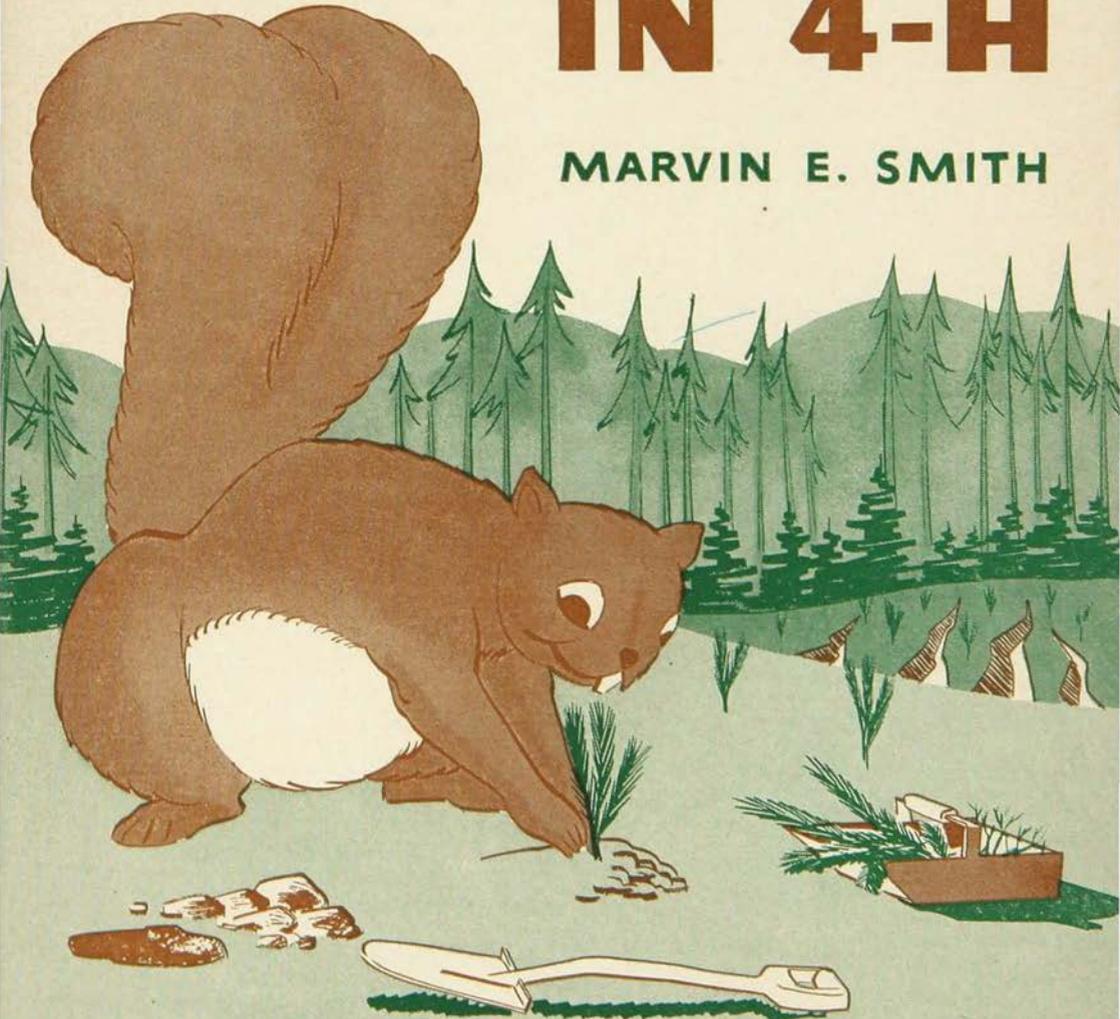


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# Forestry

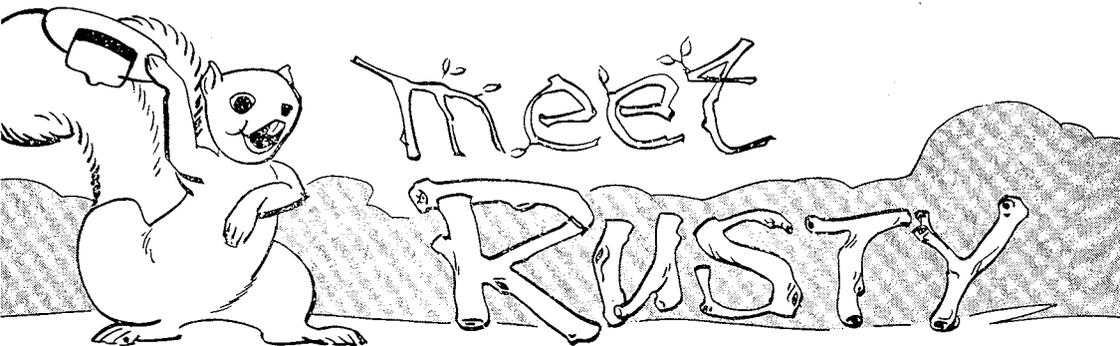
## IN 4-H

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U. S. DEPARTMENT OF AGRICULTURE

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He's a lively little squirrel who is going to escort you through the pages of this bulletin. We picked him for the job because he has a deep love for our forests and is an ardent tree planter.

Because of his interest in conservation Rusty is interested in all three parts of the 4-H Conservation Program. In addition to this Forestry Project there are the 4-H Conservation Activity and the 4-H Soil and Water Conservation Project.

Rusty says, "I like all three because they have good aims."

1. To develop an appreciation of our natural resources.
2. To restore our natural resources to normal where they have been depleted.
3. To protect those natural resources we now have.

"Keep this bulletin handy," says Rusty. "And use it as a guide while you are enrolled in this project.

"First of all, write your name in this box."

**This bulletin is the property of**

\_\_\_\_\_

**of the \_\_\_\_\_ 4-H Club,**

**to be used in my 4-H Forestry Project.**

## Foreword

This Forestry Project Bulletin is written for 4-H Club members and leaders throughout our state. The club member from the prairie will discover phases of the forestry project he can carry out, just as surely as a member from northern Minnesota can.

It is not the purpose of the forestry project bulletin to make foresters of 4-H boys and girls. The hope is rather that they will be better farmers and better citizens for having completed various phases of the project.

Forestry has a definite, valuable relation to farming in the wooded sections of Minnesota. Approximately five million acres of forest land and more than one-fourth of the remaining good timber is owned by farmers. Obviously, a working knowledge of farm forestry, applied along practical lines, should add to farm profits.

Every farmer should know the uses and value of different kinds of trees and how to use trees to shelter livestock, crops, and the home.

In this bulletin the club member can choose from a variety of lesson units that will help to develop knowledge, understanding, and skill along these lines.

A word of caution—don't look on this bulletin as an end in itself. It is a tool to be used to make intelligent and efficient use of your time and effort. It is also a signpost which can give purpose and direction to your initial interest and point the way to further achievement beyond the scope of this bulletin.

For the sake of convenience and clarity, the project material is divided into four divisions. They are (1) Forest appreciation, (2) Raising and planting trees, (3) Forest protection, (4) Harvesting forest products. Under each division heading you can select one or more units of project work. You are told how to proceed on each unit and are given suggestions for demonstrations and exhibits.

Project material is not arranged progressively from less difficult activities in Division I to more advanced units in Divisions II, III, and IV. Instead, you may begin project work in any division. But your special interests, previous experiences, knowledge, and local opportunities will in large measure determine the division and unit in which you begin. Adult leaders can give you valuable advice in this connection.

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## FOREST APPRECIATION

**Unit No. 1: Learn to know and be able to identify 10 trees native to Minnesota.**

**How to Do It:** The study of trees and plants can be turned into a very pleasurable year-round hobby for the 4-H member of any age. Plant study (or “botanizing”) is a splendid hobby that can be carried into adulthood. It will encourage you to spend many enjoyable hours outdoors, develop mental alertness, and gain an understanding of the amazing wonders of the world in which you live.

The fascinating study of trees consists of (1) finding and observing trees outdoors and (2) learning facts about them. It's entirely possible to learn many of the things you want to know about trees by reading books about them, but a really close acquaintance comes from observing them in their natural surroundings.

The easiest way to learn the name of a tree is to ask someone who knows. Actually, this is a good way. You'll use it many times when a tree is difficult to identify.

On most occasions though, you will take pride in being able to make the identification yourself. To help you in identifying trees, several bulletins and handbooks on trees can be recommended. *Trees of Minnesota*, a pocket manual, can be obtained by writing to the Department of Conservation, Division of Forestry, State Office Building, St. Paul, Minnesota. The Webb Publishing Co., St. Paul, Minnesota, has available a manual entitled *Common Forest Trees of Minnesota* that is well illustrated and easy to understand.

And one of the more complete books about trees is the 1949 Yearbook of the United States Department of Agriculture entitled

*Trees.* Besides the illustrated descriptions of trees, you will find in its 944 pages an immense fund of interesting subject matter on trees.

In your project of learning about trees you will be introduced to the term, analytical keys. These keys state the most reliable characteristics by which groups of trees and individual trees are classified. These keys are arranged in outline form. To use them you start at the beginning and simply run down the name of the tree.

The best way to illustrate the style and use of plant keys is to make a small key for some familiar objects.

An eraser, an automatic pencil, a fountain pen, a writing pad, and a book are objects commonly seen together in your school-room. Each object has characteristics that make it different from all the others.

Suppose we arrange short statements of similarities and differences in outline form as follows:

1. Object flexible and made of red rubber ..... Eraser
2. Object not flexible and not made of red rubber.
  - A. Object flat and oblong; composed of pages.
    - (1) Pages bound together; bearing print ..... Book
    - (2) Pages only gummed together; not bearing print ..... Writing pad
  - B. Object long, slender, and cylindrical.
    - (1) Object with a flattish tip; writes with ink ..... Fountain pen
    - (2) Object with a conical tip; writes with lead ..... Automatic pencil

Now, wouldn't you agree that a person could identify any of the above objects, even though he never had seen any of them before? This key to common things is quite similar to a botanical key, and you will use it in the same manner.

Equip yourself with a good manual on trees and lots of curiosity, and you're ready to begin your friendship with trees. A good place to start this project is at a 4-H Club camp. Your club leader, county extension agent, local forester, or extension forester will be glad to help you.

In the record form story of your project, give the names of trees that you learned to identify. Tell what principal products they give us, and describe any uses they have on the farm.

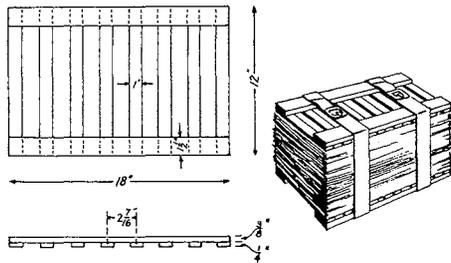
**A 4-H Demonstration** showing how to use a plant key for identifying plants.

1. Select an average leaf and twig sample from any tree you wish.

2. On a large display board print the parts of the plant key that are necessary to identify the plant specimen.
3. Point out the plant characteristics. Use your plant key chart to show how the plant specimen can be identified.

**Unit No. 2: Make a standard size wooden plant press for pressing and drying samples of leaves, flowers, and fruits.**

**How to Do It:** A plant press is the apparatus used to dry plant specimens under pressure. Collecting and mounting leaf specimens later will be more enjoyable if you have a plant press for drying the leaves and twigs properly. Making your press is an easy task. Follow directions carefully and complete each step to the best of your ability, and you will have the satisfaction of a job well done.



Plant press measurements.

Discarded apple crates or similar fruit boxes can furnish materials for making the plant press. Measure and saw these out:

1. Four pieces of wood 18" long, 1 1/2" wide, and about 3/8" thick.
2. Sixteen pieces of wood 12" long, 1" wide, and about 1/4" thick.

Also, have these materials and tools on hand:

1. Thirty-two small nails or small 1/2" screws.
2. Hammer, screw driver, and a square.

The procedure is to make two frames out of the slats. Use one-half of the material for each frame. They should appear as in the drawing above.

To make the press ready for field use, you should get these:

1. Two buckle straps or pieces of rope, each about four feet long.
2. At least 20 newspaper sheets for holding plant specimens.
3. Two pieces of cardboard 12" by 18" in size.

**Unit No. 3: Collect, identify, mount, and label leaves and twigs from at least 10 trees.**

**How to Do It:** What better idea is there than to follow up on Unit No. 1 and collect leaf and twig samples from the 10

trees you are already acquainted with? You will have a running start on your collection (botanists call it a herbarium), and can, therefore, pay closer attention to the best methods of preparing leaves and twigs for mounting and display.

A neat collection of representative plant specimens from your locality is a fine exhibit for your 4-H Club, school, or local fair. It will be interesting to your friends and neighbors to see how many different trees do grow in the area. And they will undoubtedly be as thoroughly surprised as you were in the beginning.

Let's hope you don't feel that beginning a plant collection is impossible because you aren't able to visit distant places. Actually, you can begin on the grounds around your home. Wonderful opportunities for collecting are also found along small streams and lake shores. And nearby ravines and farm woodlots are likewise profitable places to visit.

The only equipment you need is a small knife, a small pad of notepaper, and a large-paged magazine. In the field, the specimens you take can be conveniently carried between pages of the magazine. As you collect each sample you should add a sheet of notepaper bearing the collection number, the place, the date, and notes as to the surroundings.

Take only good, average specimens. Small seedlings or new growth on a tree are often not typical of the particular tree.

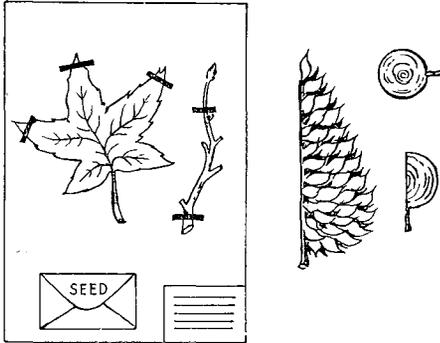
Within a few hours after collection arrange the sample leaves and twigs in the most natural position between a single fold of newspaper sheet. And in order to show any differences between upper and lower leaf surfaces, turn one or more leaves to show the bottom surface before drying them.

Follow these directions on how to pack the plant press. First lay several newspaper sheets on one of the press frames. Then add a plant specimen in its single newspaper sheet, followed by several sheets of newspaper to separate it from the next specimen. Keep this up until the plant press is packed. Strong pressure on the press is necessary, so wrap it tightly with straps or pieces of rope.

Ordinarily 10 days in the press is necessary to dry specimens properly. About the fourth day you should figure on changing the newspapers for dry ones. Otherwise your specimens are apt to get discolored or rotted by molds.

After the drying is completed, mount your specimens on white paper stiff enough not to buckle when it is handled. The drawing on the next page shows good mounting.

Transparent tape or gummed tape is used for fastening leaves and twigs to the paper. Large cones or pulpy fruits can be cut in half and pasted flat side down to the mounting sheet. Small seeds are displayed best in transparent envelopes pasted to the mounting paper.



How to mount specimens. Cut cones and pulpy fruits in half to mount.

The mounting sheet label is ordinarily placed in the lower right-hand corner of the sheet. The information you put on this label will increase in value over the years, so be thorough. Include the common name, date, place of collection, name of collector, and the commercial and farm uses of the tree.

The next step is to bind your plant mountings in a folder with your name, club, and year of your membership printed on the outside front cover.

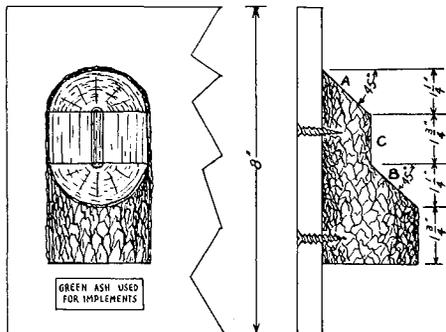
The next step is to bind your plant mountings in a folder with your name, club, and year of your membership printed on the outside front cover.

**Demonstration Hints:**

1. Prepare a talk and demonstration on the way to use a plant press and prepare plant specimens for mounting.
2. Leaf printing makes an interesting demonstration. A collection of leaf prints is quite permanent because there are no dried specimens which crumble in handling. Equipment required consists of: tube of printers' ink, 8 x 11 inch piece of window glass, soft rubber roller, sheets of newspaper, and paper forms for permanent collection.

**Unit No. 4: Collect and mount wood specimens from at least 10 native trees.**

**How to Do It:** Have you ever wondered why skis are made of hickory, baseball bats of ash, and floors of oak, maple, and birch? Wouldn't it be interesting as well as useful



How to cut and mount wood samples.

to know what makes various woods suited for certain uses?

There's scarcely any better method for you to gain knowledge about wood and its uses than by making a wood collection. And the facts you learn can be applied in the home use of lumber from the farm woodlot.

Wood samples are usually prepared and mounted as illustrated on page 9.

1. In either case get samples of uniform size. The board-type sample should be 5 inches long, 4 inches wide, and from  $\frac{3}{4}$  to 1 inch thick. Smooth the side that will show.

2. Wood samples cut from tree branches should be 2 to 3 inches in diameter, 6 inches long, with ends sawed square. Air dry the blocks for several weeks before attempting to finish the shaping. Cut each block as shown in the drawing, and then sand and varnish the surfaces before mounting.

3. Either type of wood collection can be mounted on stiff, white cardboard or on a board. You might first arrange your samples on a table in order to determine what size of mounting board is needed.

4. The flat wood samples can be glued or nailed to the mounting material or screwed from the back side. Block samples should be fastened with screws.

5. Below each wood sample place a 2" by 4" card with the following information printed or typed on it:

- a. Common name of the wood.
- b. Two common uses of the wood.
- c. Two reasons why this wood is good for the above uses.

### Additional Helps:

1. USDA Farmers' Bul. 1756. *Selection of Lumber for Farm and Home Building*. 1936.

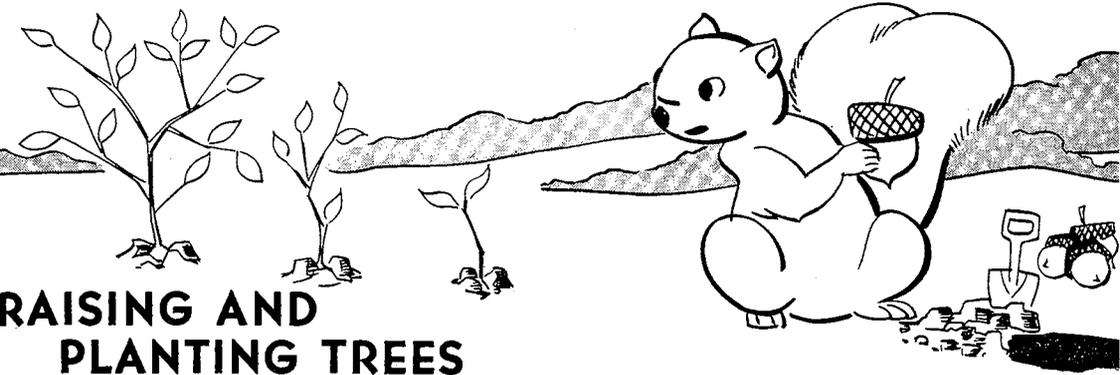
2. USDA Misc. Pub. 629. *Wood Properties and Paint Durability*. 1947. 10¢.

3. Misc. Rpt. 12, Lake States Forest Expt. Sta., USFS. *Use of Native Woods and Other Building Materials on Southern Minnesota Farms*. July, 1950.

### Exhibit Idea:

Mount a large structural drawing of a barn or house. Label the structural parts and list the kinds of native Minnesota woods best suited in each case.



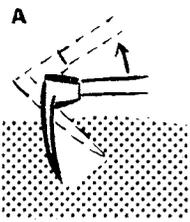


# RAISING AND PLANTING TREES

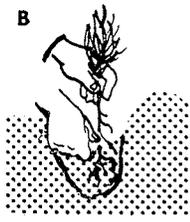
**Unit No. 1: Learn how to plant a tree. Help to sponsor an Arbor Day or memorial planting program in your school, 4-H Club, or home.**

**How to Do It:** The spring, usually between April 15 and May 30, is the best time of the year for planting trees in Minnesota.

## Set Trees by One of These Methods



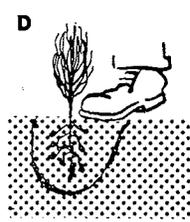
Dig hole large enough to hold roots.



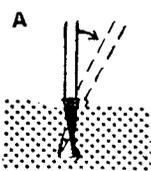
Set in hole as deep as trees were in nursery.



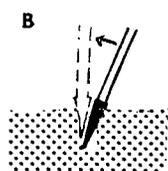
Pack soil firmly.



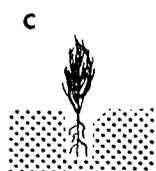
Press and level soil with foot.



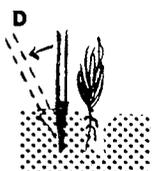
Drive mattock or planting bar into soil with blade straight up. Push handle forward.



Raise blade and drive back into soil at the same angle to get new hold. Pull back to enlarge hole.



Set as deep as trees were in nursery.



Close bottom of hole with planting bar or mattock.

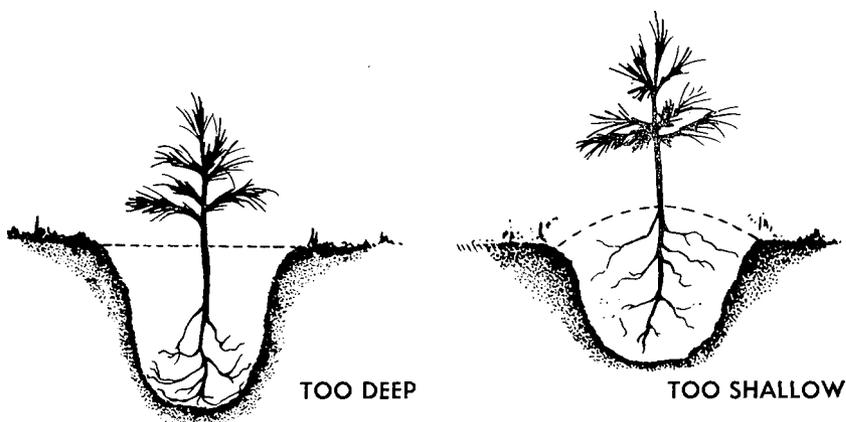


Close top of hole with heel.

Then the ground is moist and temperatures are moderate over a long period giving young trees a chance to get established successfully before late-summer droughts and severe winter weather hit them.

Actually, tree planting is a fairly simple task. Yet large numbers of planted trees fail to survive the first year because mistakes are made in planting or in care and handling beforehand.

Look at the diagrams on page 11. They illustrate two methods of planting trees. Easy, isn't it!

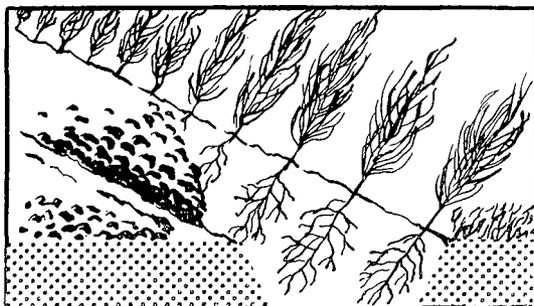


Avoid these common mistakes.

Never forget for a moment that the small trees you are planting are living things. If you keep this in mind, you'll be especially careful of seedlings before and during planting operations.

When your seedlings arrive, loosen the bundle wrappings, moisten the roots freely, and soak the packing material. Then store the retied bundle in a cool, shaded, and well-ventilated place.

Make every effort to plant the trees as soon as possible after they are received. If you find it impossible to plant the trees within two or three days after receiving them, you should remove them from the



Heeling trees in helps keep roots moist.

bundle and place them in a shallow trench called a heel-in bed. The picture on page 12 shows you how.

Water the heeled-in trees as often as necessary to keep the soil moist.

When the time of actual planting arrives, it's necessary to carry the trees in a container to protect them from drying. Carry conifers and small broad-leaved trees in a pail partially filled with muddy water.

A shallow box fitted with a wire handle also serves nicely for carrying stock in the field. Save the packing material, soak it well, and use it to cover the roots when carrying trees in this type of container. A piece of moist burlap makes a good container cover and is splendid protection against drying.

One part of this activity is to make yourself a container for carrying planting stock in the field. Another part is to take part in some tree planting activity. This may involve planting trees and shrubs about your farm home or taking part in a school or club planting bee.

As a suggestion, you could help plan a special tree-planting activity in your community. Schoolyard shelterbelt plantings and memorial plantings are activities well suited for groups. Arbor Day ceremonies are also excellent for group activity. On your record form don't overlook a story of the project as you carried it out.

*Tree planting is a good group activity.*



**Additional Helps:**

1. U. of M. Agric. Ext. Folder 85. *Tips on Tree Planting*. Rev. April, 1950.
2. U. of M. Agric. Ext. Bul. 267. *Woody Plants for Minnesota*. Rev. June, 1955.
3. USDA Farmers' Bul. 1492. *Arbor Day—Its Purpose and Observance*. 10¢.

**A 4-H Demonstration** on how to plant trees.

- Step 1. Make a box at least 18 inches square and 12 inches deep. Fill it with loose soil.
- Step 2. Get about a dozen seedlings or transplants and wrap them up to make a bundle of trees.
- Step 3. Demonstrate the correct handling of planting stock and the correct method of planting a tree.

**Unit No. 2: Learn how to collect, store, and market tree seed.**

**How to Do It:** When you begin to collect tree seed the door will open to many fascinating discoveries. You'll learn, for instance, that nature has provided trees with a variety of clever devices for scattering seed, that some individual trees bear seed and some do not, and that not all tree seed ripens in autumn.

Possibly you can benefit in other ways. In some sections there is opportunity for extra income in the sale of evergreen cones to public and private nurseries. Furthermore, this activity is a logical introduction to the establishment of a home tree nursery (Unit No. 3).

Most of our Minnesota trees ripen their seeds in late summer or fall. Exceptions are the elm, soft maple, cottonwood, and



willow. These trees flower in April and their seed matures in May. (Chinese elm is the one kind of elm whose seed ripens in fall.)

Collecting elm and maple seed will be no problem for you. The seed falls to the ground when ripe and can be swept or raked up. Elm seed is blown easily by the wind, so look for drifts of seed in sheltered corners and alongside street curbs. Soft maple seed is heavier than elm. It falls nearer the parent tree and is easy to rake into piles. Collect seed from parent trees that appear healthy and bear large quantities of seed.

Seeds which ripen in spring lose most of their ability to germinate after three or four weeks. For this reason you should plant them as soon as possible after gathering the seed.

Large nuts are easier to gather after they drop to the ground, but small fruit-type seed is ordinarily picked from the tree. You can either climb the tree or cut the seed from the tree with a hook-shaped blade (perhaps a section from a mower bar) fastened to one end of a long pole.

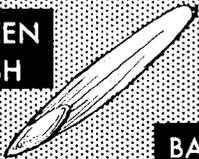
Ash, basswood, birch, cherry, hackberry, locust, Kentucky coffee tree, red maple, and hard maple seeds as well as nuts of all kinds ripen in late summer. They are planted in fall or stored until planting time the following spring.

To store nut seeds properly over the winter, bury them by layers in moist, well-drained soil. Common lilac, Kentucky coffee tree, basswood, and caragana can be stored at room temperature in a sealed container like a fruit jar. Dry, cold storage in fruit jars is recommended for ash, birch, elm, hackberry, honey locust, hard and red maple, mountain ash, and any conifer seed.

All our native evergreens such as pine and spruce ripen their seed in late August or September. If you live in areas where cone collection is possible, ask the nearest state or federal forest officers about the demand and price for cones of various species. Cones are picked by hand from standing trees or trees recently cut.

Before you collect cones, be sure they are ripe. Open a scale of the cone and see if the seed at the bottom of the scale is brown. If so, the cone is ripe and ready for collection. It is not ripe when the seed is white and full of milk.

**GREEN  
ASH**



**WHITE  
OAK**



**BASSWOOD**



**BLACK  
WALNUT**



**CHOKE  
CHERRY**



Good, ripe cones are unopened, brownish, and fresh looking. Old cones open their scales in dry weather and close them in wet weather, so be sure you do not collect cones from which the seeds have already dropped. After you have gathered your cones, store them in a cool, dry place until you are ready to take the seed out or sell the cones.

In this unit it is suggested that you do one or more of the following:

1. Make a collection of seeds and mount them on cardboard or put them in wide-mouthed bottles. Indicate on labels how the seed is scattered, that is, whether by wind, animals, birds, or water.
2. Collect and send shrub and tree seed to the State Forest Nursery at Willow River or Badura, Minnesota.
3. Ask your local forester about the market for evergreen cones. Collect and sell at least one bushel of ripe cones.

### **Unit No. 3: Establish and care for a home tree nursery bed.**

**How to Do It:** You can easily grow broad-leaved trees like elm and ash from seed you yourself collect. It isn't a good idea, though, to attempt to grow evergreens from seed because this is rather difficult.

But evergreens—or conifers as they are called—are important in forestry plantings, be it woodlot or shelterbelt. Therefore, later on you will learn how to include them in your tree nursery bed.

**Seedbed.** The choice of location is usually limited to the immediate area where you live. As a result you may not find a place to satisfy all requirements of a good seedbed on your farm. Yet keep the following points in mind as you search for a location.

1. A well-drained area with a gentle slope is the best location.
2. Sandy loam is the best soil.
3. Protection from drying winds is desirable.
4. Soil that is free from grass roots and weeds is preferred. (If the area is sod-covered, summer fallow to break up clods and store up moisture.)
5. A plot near home where water is conveniently available is ideal, especially if it can be fenced off from livestock. Part of the family garden tract usually satisfies these conditions very well.

Standard nursery beds are 4 feet wide and 6 feet or more long. A bed 4 feet by 21 feet will allow production of about 500 seedlings when the plants are spaced 2 inches apart in rows that are 12 inches apart.

The first step in preparing the nursery bed is to build a frame out of old boards and set it on edge around the seedbed. Then

nail the frame to stakes driven in the ground. This frame is not absolutely necessary, but it will help a great deal to prevent the soil from washing away.

Next thoroughly work the soil within the frame to a depth of 8 inches with a spade. Break up all lumps. If you can get well-rotted manure, spread several inches of it over the ground before spading.

When you finish spading, remove stones, sod lumps, and roots by raking several times.

Now you can begin to form the seedbed by filling up the frame. Make the middle of the bed a few inches higher than the sides. On the sides the soil should be an inch or two below the edge of the frame so that soil is not washed away. Finally, press down the surface of the soil with a flat board.

**Sowing Seed.** Seed which ripens in spring or early summer should be sown at that time (examples: elm and soft maple). Seed that you collect after it ripens in autumn may be sown then or stored until spring. (See Unit No. 2, which tells about storing seed.)

In autumn, plant the seed just before cold weather sets in. When the seed is planted too early in fall and warm weather follows, it often sprouts and is later killed by sudden temperature drops. Seed stored over winter should be sown in spring just as soon as frost is out of the ground.

Mulch your fall sowings with three inches of leaves. (Straw may be used if you think it is free of weed seeds.) A mulch will prevent rain from washing out the seed and will also prevent alternate freezing and thawing of the ground, which heaves seed from the ground. Remove the mulch as soon as the seedlings appear in the spring.

Small or thin seed, such as elm seed, can be broadcast rather thickly on the seedbed; or it may be planted in drills as large seed (walnut, Russian olive, wild plum) is planted. When you broadcast seed, cultivation is of course done by hand.

If you broadcast the seed, press it into the loose soil with a board. Cover lightly with a half inch of soil and then a light mulch of leaves or clean straw.

Always sow large seed in drills, and sow it thick enough to get 12 to 15 seedlings per foot. Cover large seed to a depth equal to two or three times its own thickness.

**Growing Evergreens.** Small evergreens grown from seed for two years are commonly described as 2-0 seedlings. They are also



Trees will survive and grow better if cultivated cleanly.

known as lining-out stock. This is the type of evergreen plant that is very well suited to the 4-H Home Tree Nursery. After they have been growing in your nursery bed for two years, they would be called 2-2 transplants. As such they are ready for planting in the permanent shelterbelt or woodlot location.

You can get 2-0 evergreen seedlings from a commercial nursery. These seedlings should be planted three inches apart in rows that are 12 inches apart. Be careful to see that roots are kept moist until the seedlings are transplanted.

Resetting seedling stock (2-0) helps make sturdy roots and slows up top growth. The result is a plant better able to compete with weeds and survive poor growing weather.

**Watering.** If water is conveniently close, keep your seedbed moist until germination begins. Sprinkling during summer is not harmful, but it isn't necessary during seasons of normal rainfall.

**Weeding.** Begin weeding early to avoid damage to the small trees when you pull up large weeds.

**Shading.** Evergreen seedlings are tender and therefore likely to be fatally injured by direct rays of the sun. So give them partial shade such as a covering of brush or tree branches in leaf. A better suggestion is



to use a section of snow fence or corn cribbing hung on stakes about 12 inches above the ground.

**Additional Helps:**

1. USDA Farmers' Bul. 1123. *Growing and Planting Hardwood Seedlings on the Farm.*

2. Univ. of Minn. Ext. Form. *How to Raise Evergreens From Seed.*

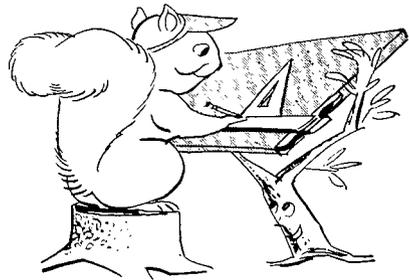
**Unit No. 4: Make a planting plan for the farmstead shelterbelt.**

**How to Do It:** From north to south and east to west in our state you will find farm people planting trees for farmstead protection. It might be said that almost every 4-H Club member could undertake this unit of the forestry project because there is practically a universal desire and need among farm people for the protection afforded by trees.

Summer or early fall is the best time for starting this unit of the forestry project because ground preparation must necessarily be started then. Furthermore, if plans are made early, trees can be ordered in fall while nursery assortments are still complete.

Scarcely any two shelterbelt planting plans (or maps) will be alike because farmstead layouts and family preferences will differ very much from farm to farm.

It is not unlikely that where you live the trees are very old—veterans of plantings established by our pioneer settlers. But there are many farmsteads with little or no tree shelter. In some cases they are newly established farms; on others nothing was ever done to rebuild



the original shelterbelt as the trees died of old age.

Before drawing your map or planting plan, get a copy of Extension Bulletin 196, *Planting the Farmstead Shelterbelt*. Study the suggestions it contains and note particularly the shelterbelt diagram on page 6.

First take a clean sheet of paper that you can attach to your record form, and draw a scale map of your farmstead. Show the arrangement of all the buildings with respect to each other and the location of roads, livestock lanes, fences, feed lots, and any trees. On the map where the present grove occurs, write in the

names of the kinds of trees that are there. If they were planted in some orderly arrangement, list them that way.

The next step is to refer to Bulletin 196 again and adjust the standard shelterbelt plan to your farmstead map. A good suggestion is to go over the ground again with your parents. Be sure you have chosen the best possible location for farmstead protection. Every farm situation is different, and only rarely does the finished plan follow completely the standard plan in the bulletin.

Note that eight rows of trees are recommended in the main belt. So where you are rebuilding an old grove, add rows of trees and shrubs to make the equivalent of at least eight rows. Also, you should indicate on the plan the kinds of trees you intend to plant. Pages 5-7 in Bulletin 196 furnish suggestions for choosing and arranging the several kinds of trees. Extension Folder 85, *Tips on Tree Planting*, provides more information on what trees to plant.

Don't forget to include measurements on the plan, for they will help you in spring when you stake out actual tree row locations. You will have to cultivate these trees for several years after planting so be certain to allow plenty of room for cultivating equipment between the rows of trees.

Using the recommended spacing between trees in the row, decide on the number of trees and shrubs of the various kinds you will need. Add this information at the lower left-hand corner of your planting plan.

As a suggestion you might title the planting plan as follows:

4-H Farmstead Shelterbelt Plan  
for  
John Anderson Farm  
Brown County, Minnesota

### **Unit No. 5: Plant a farmstead shelterbelt.**

**How to Do It:** Your first job is to break up the sod on which you will plant the shelterbelt, since sod is not a good cover for the shelterbelt planting site. To get a loose, mellow soil for spring planting work, the ground should be summer fallowed the year before planting. This is the only satisfactory method of putting soddy or weedy land in shape for most shelterbelt plantings. Fall plowing is recommended for light soils that might be blown away.

When spring planting time comes, you can begin to carry out that well-laid shelterbelt plan. Before the trees arrive from the

nursery, spend a few minutes reviewing Unit No. 1 (Learn How to Plant a Tree) in Division II. Follow closely the suggestions for taking care of the bundle of young trees on arrival and before and during planting. You will find helpful information, too, in Bulletin 196, *Planting the Farmstead Shelterbelt*, and Folder 85, *Tips on Tree Planting*.

Should you be planting several hundred or more trees, it might be wise to ask your county agent about the possibility of using a tree-planting machine. Since it is especially designed for the purpose, it makes it possible to plant several thousand trees a day. However, an ordinary double-bottom plow is a reasonably good substitute for a planting machine. Ask your county agent to explain how to plant trees with it.

**Exhibit ideas:** In preparing an exhibit for achievement day or the county fair, the following suggestions might be helpful.

Step 1. Mount several pictures showing a view of the planting operation and different views of the completed planting.

Step 2. Mount an enlarged drawing of the planting plan on a board.

Step 3. Print signs giving the major steps in planning and actual planting.

#### **Unit No. 6: Care for the newly established shelterbelt planting.**

**How to Do It:** Every spring there are many people, oddly enough, who very enthusiastically plant trees and yet afterwards give the trees scarcely any help in the fight for survival against drought, weeds, insects, and diseases. These same people would never think of planting corn and not giving it care. They know that yield per acre after planting depends on proper cultivation, fertilizing, and control of insects and disease.

And so it is with trees. Just ordinary, intelligent care during the growing season will work wonders. Treat your trees as a crop and they will grow twice as fast compared to those left to shift for themselves.

Caring for the young shelterbelt planting doesn't involve only spending time on it—you should also know what to do and when to do it. So get whatever reading matter you can and learn what to do about cultivation, protection from livestock, rodents (rabbits, pocket gophers, and mice), and pruning.

In this unit tell what practices you used in the care of your trees, and describe each one briefly. Describe the differences

between an ungrazed shelterbelt and one where livestock has access. Why is the grazed shelterbelt less effective in protecting the farmstead?

**Exhibit Idea:**

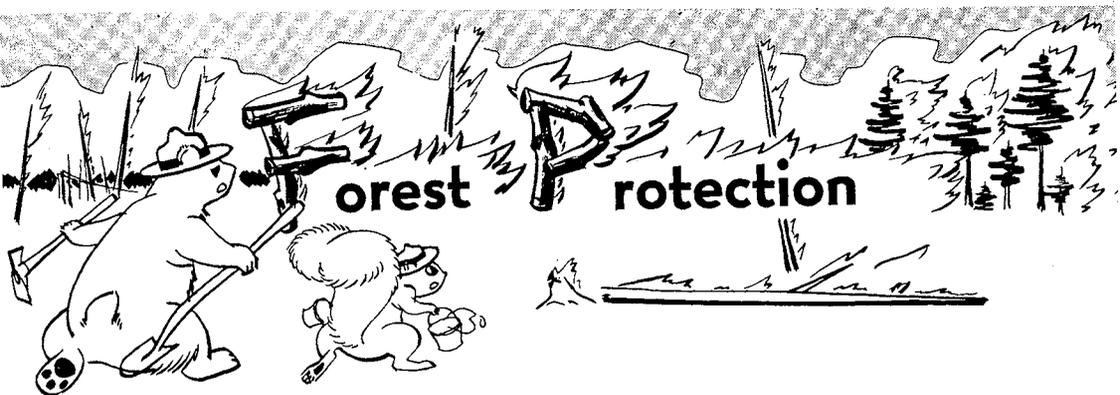
Build the exhibit around some central idea such as *Shelterbelt Care—Not Carelessness*. Use briefly worded signs and photographs. Mount them around a centrally located chart drawing of your shelterbelt planting.

**Additional Helps:**

1. U. of M. Agric. Ext. Bul. 196. *Planting the Farmstead Shelterbelt*. Rev. 1951.
2. U. of M. Ext. Folder 91. *Pruning Young Windbreak Trees*.
3. U. of M. Form F-5. *A Rabbit Repellent for Protection of Shelterbelt Trees*.
4. USDA Leaflet 86. *Protect Hardwood Stands from Grazing*. Rev. 1951.

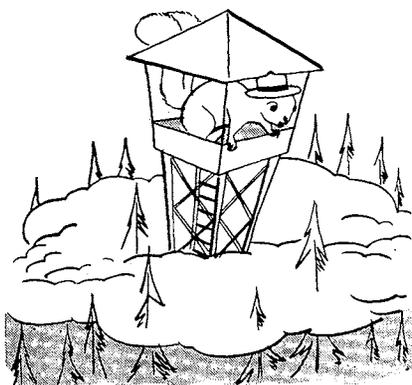


Exhibits and demonstrations—both are a part of the 4-H Club projects. 4-H'ers use them to show and inform others about their activities.



**Unit No. 1: Observe and report on the operation of a forest fire lookout station.**

**How to Do It:** Visit a fire lookout station and talk to the lookout. He can give you information for a short report on the organization for forest fire control and the part he plays in this work.



Explain to the towerman that you are a 4-H Club member. This man, as well as other state and federal forestry personnel, will be happy to explain how his organization operates. Ask him to tell you about the state forest law which requires a written permit for burning such things as brush, logging slash, meadow grass, and stubble.

Find out what are the most frequent causes of forest fires in that area. State in your record form story how you can be more careful with fire in the future and thereby prevent forest fires.

**Additional Helps:**

1. USDA Misc. Pub. 290. *The Work of the U. S. Forest Service*. Rev. 1945. 10¢.
2. USDA Agric. Inf. Bul. 136. *In Your Service—The Work of Uncle Sam's Forest Rangers*. 1955.

**Unit No. 2: Prepare and display an exhibit on forest fire protection.**

**How to Do It:** As an individual club member, you can play an important part in helping to prevent the shameful waste caused

by forest fires in our state. You can do this by helping to make the public conscious of the destruction brought about by forest fires. Exhibits that you or your club prepare as a group project can be quite effective in acquainting other people with the fact that we must keep our forests green and growing.

Build your exhibit around one central idea. For example: **Forests Mean Jobs—Protect Them from Fire. Burned Acres Are Barren Acres. What Does Our Carelessness Cost?**

Adapt your experience with other 4-H exhibit work as to the design and construction of the forest fire protection exhibit. Local foresters, rangers, and county agents will help you find materials and suggest ideas. You can also write to the Executive Secretary, Keep Minnesota Green, Inc., 555 Wabasha St., St. Paul 2, Minnesota, for signs and other exhibit materials.

"Where can I display my exhibit to best advantage?" you ask. One possibility is to arrange for space at school. A timely period would be National Fire Prevention Week, usually proclaimed by the President in October. Anytime during the fall or spring forest fire seasons is appropriate, too. Many local merchants and bankers would undoubtedly let you use their windows.

### **Unit No. 3: Make up your own fire prevention poster.**

**How to Do It:** You will have no difficulty obtaining a wealth of literature from (1) United States Forest Service, Washington

A simple original idea made this fire prevention poster a winner in a school contest.



25, D. C., (2) Department of Conservation, Division of Forestry, State Office Building, St. Paul, Minn., and (3) Keep Minnesota Green, Inc., 555 Wabasha St., St. Paul 2, Minnesota.

Examine all of the literature thoroughly and read some additional material to develop as many ideas as you can. Choose the idea that impresses you most and make up your own fire prevention poster. Keep it original. Use crayons or water colors on stiff mounting paper measuring 28 inches long and 22 inches wide.

#### **Additional Helps:**

1. USDA Misc. Pub. 162. *Our Forests: What They Are and What They Mean to Us*. Rev. 1944.
2. USDA Misc. Pub. 543. *Some Plain Facts About the Forest*. Rev. 1949.
3. USDA YS 2154. *Forest Resources and the Nation's Economy*. 1949. 5¢.

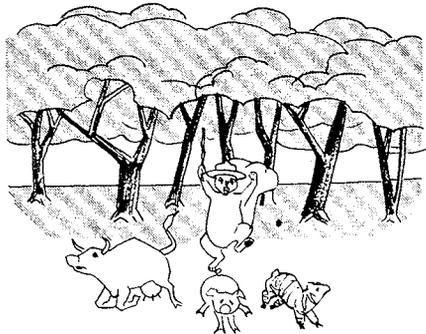
#### **Unit No. 4: Compare the relative values of woodland forage and improved pasture forage.**

**How to Do It:** If we were to list the three primary destroyers of our forests and farm woodlands, they would be these:

1. Fire
2. Livestock grazing
3. Insects and disease

Grazing of livestock in our farm woods, especially, is still a widespread destructive custom. The damage, while not as sudden as that caused by fire, insects, and disease, is no less severe and just as certain. No amount of forage that livestock get in the woodland can offset the injury that they do.

There are many wrong ideas about the amount and value of the grass in wooded areas. The following exercise will demonstrate to you that woodlands are much inferior to improved pastures for grazing.



1. Make your observations and measurements on two plots as much alike as possible. Stake out one nine-foot square plot in a grazed woodland and one in an open improved pasture.

2. Treat both plots alike. Do not allow livestock to graze on either plot for a six-week period.
3. Have a note pad and pencil handy, and jot down your observations of the following on each plot.
  - a. color of grass
  - b. average height of grass blades
  - c. density (good, fair, or poor)
  - d. height when headed out.
4. Mow the grass on each plot, rake it into a pile, and weigh the clippings from each plot separately.
5. After a week or two look at the plots and measure what growth has been made since the grass was cut.
6. Examine a square yard plot in an ungrazed woodlot, and make a count of all the tree seedlings you can identify.

Keep written notes of your observations and measurements and later make them part of your record form story covering this unit of work.

What are your conclusions as to the comparison of woodland "pasture" and improved pasture? Read USDA Leaflet 86, *Protect Hardwood Stands from Grazing*, then draw a map of your farm to show how pastures could be fenced to keep livestock out of the woodland.

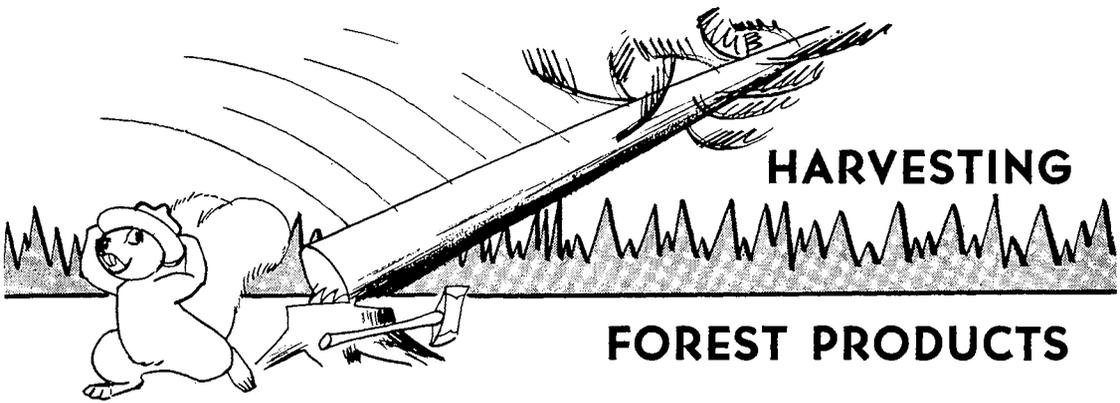
#### **Exhibit Suggestions:**

Under the theme "What Is Your Woodland Pasture Worth?" show the difference between improved pastures and woodland pastures. Do this by making model haycocks to show the differences in yield of grass per acre. Use small animal models to show differences in animal-carrying capacity.

#### **Additional Helps:**

1. USDA Leaflet 86. *Protect Hardwood Stands from Grazing*. Rev. 1951.
2. Bul. 368, Purdue Univ. Agric. Exp. Sta., Lafayette, Indiana. *The Natural Regeneration of Farm Woods Following the Exclusion of Livestock*.
3. Bul. 431, Purdue Univ. Agric. Exp. Sta., Lafayette, Indiana. *The Development of Natural Reproduction in Previously Grazed Farm Woods*.
4. Special Circ. 30, Wisc. Univ. Agric. Ext. Div., Madison, Wisc. *Don't Put Your Cows in This Picture*. 1952.





**Unit No. 1: Manage one acre or more of woodland as a farm crop. Do all necessary planting, thinning, and pruning.**

**Introduction:** How many of you would think of the farmer as being in the business of growing trees? "Producing corn, grain, pork, beef, and dairy products is their business—not growing trees," most of you would say.

Yet farmers in Minnesota own approximately five million acres out of the 19 million acres of forest land in our state. On the basis of area alone we predict that many thousands of farm operators can discover in trees a profitable new farm crop.

Farm woodlands generally are well located for successful management because they are on good soil and close to markets. The tree crop doesn't mature in one growing season like corn or grain, which need to be harvested the same year. Instead, during a period of low prices, shortage of labor, and urgency of other work, the timber harvest can be delayed and the trees stored on the stump without serious loss. It's like having money in the bank to have a well-managed farm woodland.

Farm people report that timber harvests from the woodland have lifted mortgages, replaced barns destroyed by fire, provided lumber for new construction and repair of farm buildings, and supplied posts, fuel, and other products. Isn't it obvious that the farm woodland can be a real asset to the farm?

It is said that "we learn as we do." Then what better way is there for you to learn the management of tree crops than by actually trying it out on a small demonstration area?

**How to Do It:** Begin by setting aside one acre—either square or rectangular—of the farm woods as your project area. A square

acre is approximately 208 feet on the side. By using a surveyor's unit of measure (one chain = 66 feet) you can lay out a rectangular acre measuring two chains by five chains.

It's often convenient to select as a starting point some place in the woods which has a natural boundary, such as a path, road, or fence. Use a ball of twine to separate the plot from the rest of the forest.

Many books have been written on forestry practices, so the subject could hardly be covered in this limited space. However, you should know some of the basic steps in managing forest tracts, such as thinning, improvement cuttings, pruning, liberation cuttings, and marketing.

First, examine your plot and become familiar with it. Know what kinds of trees grow there, learn to know merchantable species from weed trees, and draw some conclusions as to vigor of the trees on the plot.

Let this be one important objective of your management: try to grow the proper number of trees per acre. The yield of wood per acre is dependent on the amount of plant food in the soil. If this plant food must be divided among too many trees they all will tend to be stunted. If too few trees are on the land, then available land and plant food is not being used. Moreover, trees grown in the open are too limby and yield low-grade material.

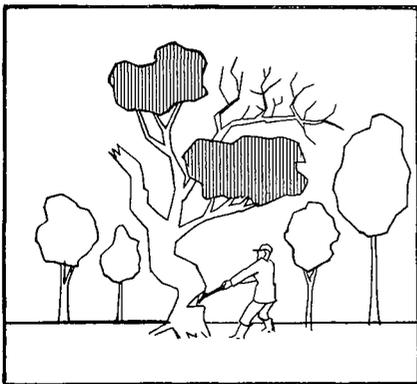
Use this general guide to find out whether you have too many or too few trees: **There should be as many feet between trees as there are inches in the average stump, plus four inches.** For example, if trees average six inches in diameter, they should be spaced  $6 + 4 = 10$  feet apart. If the average diameter is 10 inches, the trees should be 14 feet apart. Exceptions to this rule-of-thumb are trees smaller than six inches in diameter, which do not have to be spaced closer than six feet apart. Even small transplants are planted 4-6 feet apart.

You know that a gardener, an orchardist, or a poultryman regulates and improves his crop or flock in order to get the best development. Likewise, the person raising trees as a crop "works his timber" at certain times. Such timber-stand improvement can include any one or all of the following operations: (1) improvement cutting, (2) thinning, (3) liberation cutting, and (4) pruning.

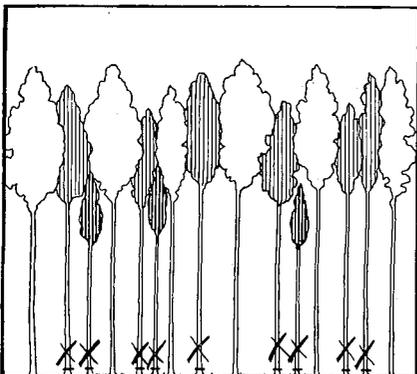
The following descriptions will get you acquainted with these various operations:

## Operation

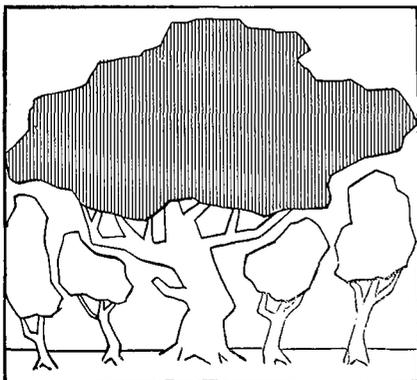
## Description of practice

**1. Improvement cutting**

If you have mostly seedlings or small saplings, make cleanings by cutting away brush and hardwood sprouts where they interfere with better trees. In older timber cut low-value species like aspen, jack pine, elm, soft maple where they hinder growth of valuable trees like Norway pine, red oak, hard maple, and green ash. Remove diseased, deformed, or insect-infested trees.

**2. Thinning**

Cut out some trees where young ones are too thick. Presence of dead or dying trees or a very close interlocking of limbs indicates a need for thinning. Cut the less-valuable, slow-growing, stunted, sickly, crippled, or dead trees. Postpone the first thinning, if possible, until trees to be cut are big enough to be usable. As a general rule about  $\frac{1}{4}$  of the total number of trees are removed in a thinning. Remember the rule-of-thumb concerning spacing of trees.

**3. Liberation cutting**

Scattered old trees which are overtopping fine young timber will often be found. Such trees are known as "wolf trees." You can identify them by their very limby, wide-spreading tops. They have little value because of their poor form. Cut such trees in favor of better-formed young trees having future commercial value.

#### 4. Pruning limbs



Remove all dead branches and one or two sets of living branches from trunks of young forest trees when the trees become three to four inches in diameter. This is especially important in forest plantations. Don't prune heavily—keep about  $\frac{1}{3}$  of total height of tree in a green, living top. Repeat process about every five years. Pruning is done to obtain a clear 16-foot cut of timber with no limbs; therefore limbs will eventually be removed up to about 18 feet from ground level. Use an ax to knock off dead limbs; saw live limbs with a pruning pole saw. Make smooth cuts close to the trunk, leaving no stubs. Prune only promising, thrifty trees. Call these your crop trees.

On your project plot carry out all of the forestry practices described above that are required. Consult with your county agent, Extension forester, or local forester for advice. Refer to your record form for information on records you will need to keep.

#### Additional Helps:

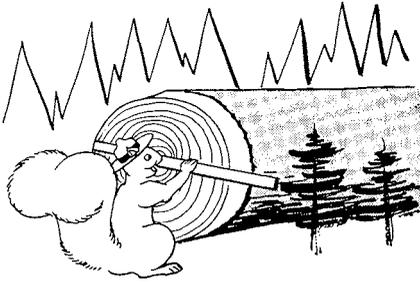
1. USDA Farmers' Bul. 1989. *Managing the Small Forest*. Rev. 1948.
2. USDA Farmers' Bul. 2008. *Logging Farm Forest Crops in the Northeast*. 1949.

Timely thinning yields salable products and gives crop trees more room to grow.



## Unit No. 2. Learn how to measure the lumber content of logs.

**How to Do It:** Timber on the farm can be harvested and sold like any other crop. But there is always the risk of doing a poor job of selling logs or standing trees if you don't make your own measurement of volume.



Certainly it makes as much sense for one to know approximately how many board feet of lumber there are in the logs or trees he is selling as it does for him to know the approximate weight of hogs or cattle he is bringing to market.

A yardstick and a Scribner Decimal C log rule (legal rule for Minnesota) are all you need for measuring the lumber content of logs that are cut and on the ground. This is called log scaling. Ask your county agent to furnish you with a table of volumes for various sizes of logs.

In order to use this table you need to measure the log diameter inside the bark at the small end and also the length to the nearest even foot (that is, 8, 10, 12, 14, 16 feet).

A log is not perfectly round. Therefore, make at least two diameter measurements and average them to the nearest whole inch. Be careful not to include the bark in your measurements.

The next step is to measure the length of the log to the nearest even foot. Logs cut properly will have an extra three inches of length over and above the standard length. This is called the trimming allowance.

Having measured log length and average diameter at the small end, use the Scribner Decimal C log rule table to find the lumber content in board feet.

Actual practice is the best way of learning something new. Therefore, scale 10 or more logs for their volume in board feet. In your record form enter the log diameter, log length, and the board foot volume for each log you measure.

### Additional Helps:

1. USDA Farmers' Bul. 1989. *Managing the Small Forest*. Rev. 1948.
2. U. of M. Agric. Ext. Service, University of Minnesota, Institute of Agriculture, St. Paul 1, Minnesota. *Log and Lumber Scale*.

**Unit No. 3: Learn to estimate board foot and cord content in standing trees.**

**How to Do It:** A board foot and a cord are units of measure, and we find them useful in the same way as other units of measure—a foot, yard, pound, bushel, or dozen.

The actual measure of a single board foot is 1 inch thick by 12 inches wide by 12 inches long. A standard cord is 4 feet high, 4 feet wide, and 8 feet long. In ordinary practice the amount of wood in logs and standing trees is expressed as being a certain number of board feet or cords.

You can count eggs to find out how many dozen you have. Or you can grab a pig and step on the scales to see how much he weighs. But in the case of standing trees you must depend on prepared tables that furnish computed volumes for trees of various heights and diameters. The table below is typical.

If you know or can measure the diameter of a tree and estimate the merchantable height you can "enter the table" and obtain the estimated board foot volume or the volume in cords.

Tree diameters are measured at a point 4½ feet from the ground. (This is known as diameter breast high—DBH.)

The only other measurement taken is length of the trunk. When estimating board foot volume, length is expressed in logs—each log measuring 16 feet. For example, if the usable length of the trunk is 24 feet, the length would be called 1½ logs. If it were 32 feet, the usable height would be 2 logs.

If you were to estimate cordwood volume, length of the trunk would be measured in units of 8 feet (a bolt). Example: a tree that has 40 feet of usable trunk would contain 5 bolts.

The height of a standing tree can be gauged quite accurately with your eye. Stand five to ten paces away from the tree. Let your eye travel up the trunk and mentally measure its length in

**Composite Board Foot Volume Table**

DBH	Number of 16-foot logs per tree						
	½	1	1½	2	2½	3	4
inches							
10 .....	14	30	40				
12 .....	28	48	66	78	97		
14 .....	40	70	96	116	141		
16 .....	54	93	129	158	191	224	
18 .....	72	122	168	207	248	292	355
20 .....	90	156	212	262	317	366	451
22 .....	111	194	262	328	392	452	563

whatever unit you are using. Stop at a point where the top is smaller than eight inches or at the main point of branching when you are estimating board feet content. Stop at a point where the top is smaller than four inches when estimating cord volume.

When you have the tree diameter at breast height and the length of usable trunk, it is a simple matter to use either the board-foot or cordwood volume table to get the estimated volume.

In this unit, find the board foot or cord content of 10 or more trees. At first you may not be quite sure of your ability. But practice will give you confidence, and very soon you will be able to select and measure merchantable timber for saw log or pulpwood content.

#### **Additional Helps:**

1. U. of M. Agric. Ext. Form F-3. *Estimating Standing Timber.*
2. Tech. Note 241. Lake States Forest Expt. Sta., USFS. *A Composite Cordwood Volume Table for Pulpwood Species in the Lake States.*

#### **Unit No. 4: Tap 10 or more sugar maple trees for sap and make maple syrup from it.**

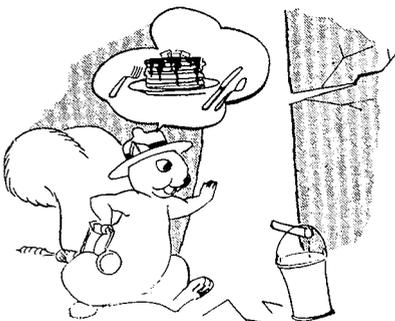
**How to Do It:** In January or February make certain that you have all the necessary equipment and that it is in good order. You will need the following items:

1. Ten or more spiles (metal spiles are better than wooden ones).
2. Ten or more metal buckets.
3. A brace and a  $\frac{3}{8}$ - or  $\frac{7}{16}$ -inch bit.
4. A shallow evaporating pan about six inches deep.
5. A 15-20 quart pail (for gathering sap from the buckets).
6. A yard of cheesecloth or flannel.
7. A felt filter.

Tapping time in the sugarbush is at hand when daytime temperatures are around 40 degrees above zero and nighttime temperatures fall below freezing.

In Minnesota these conditions generally occur in March. Do your tapping early in the season—early runs of sap are the sweetest and therefore yield more syrup or sugar.

Get some of the suggested references. Study them carefully to learn (1) what trees to tap, (2) how to tap them,



(3) how to boil sap, and (4) how to market the syrup.

Accurate data contained in your record form can be important to you personally as well as to others in their studies of the maple syrup industry in Minnesota. Your records should include the following:

1. Number of trees tapped.
2. Number of buckets hung.
3. Quantity of sap gathered.
4. Quantity of syrup produced.
5. Dates of beginning and close of tapping season.
6. Total hours of work time spent.
7. Total value of sap or syrup produced.

#### Additional Helps:

1. USDA Farmers' Bul. 1366. *Production of Maple Sirup and Sugar*. Rev. 1937.
2. Mich. State Col. Agric. Expt. Sta., East Lansing, Michigan. Circ. Bul. 213. *Production of Maple Syrup in Michigan*. Feb. 1949.
3. Univ. of Minn. Ext. Form. *Working the Sugar Bush*.

#### Unit No. 5: Pile freshly sawed lumber for proper air drying.

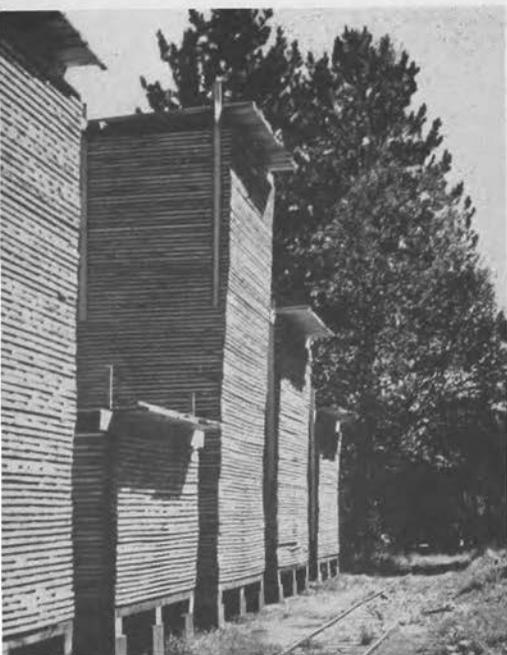
**How to Do It:** In all but a few of the western counties of Minnesota, some of the lumber required for farm building construction and repair is sawed from native-grown timber. Can you think of a building at home or on a neighboring farm in which native lumber was used?

Lumber is not ready for most uses until much of the moisture is removed. This process of drying lumber is known as seasoning. Sometimes lumber is dried in large oven-type structures called dry kilns. Seasoning freshly sawed lumber in open, well-ventilated piles is described as air drying. This widely used method is described in the following paragraphs:

New or green lumber of any kind becomes unfit for most uses if it is allowed to dry improperly.

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Warping and splitting can be prevented by proper air drying.



Wood shrinks when it dries, and shrinking may cause lumber to develop defects such as warp and split unless proper safeguards are taken to avoid them. The most important single thing you can do to avoid defective boards is to pile green lumber properly.

The accompanying illustration demonstrates correct piling of green lumber for air drying. Here are points to remember:

1. Build a strong foundation (sloping or level) at least 18 inches above the ground. Air must circulate freely beneath the pile from all directions. Choose a location exposed to the wind.
2. Separate the layers of boards with strips of wood of equal thickness. Strips 1 inch by 3 inches are good for pine and other softwoods; for hardwoods like elm and oak 1¼ inch strips are wide enough. Space these strips 3-4 feet apart for most woods—2 feet apart for cottonwood and elm. Always have one of the separators at the front and the rear of the pile.
3. Keep boards in each layer two or three inches apart for good air circulation through the pile. Boards of unequal length ought to be piled in a boxlike arrangement (see picture on page 34).
4. Do not put boards of different thicknesses in the same layer. You can pile 2x4's on edge near the bottom of the pile.
5. Build a roof to protect your finished lumber pile from exposure to sun and rain. Use any scrap boards available. Raise it about six inches above the top of the pile, give it a slope, and build it out two feet at the front and rear.

If properly piled, green lumber of our native species will season in about 60-90 days during the period June to October.

In the short story for your record form, give the measurements of width, length, and height of the lumber pile you make. Ask someone to help you identify as many as possible of the kinds of wood in your lumber pile. Include a description of the places that native lumber has been used on a farm in your community.

#### **Demonstration Hint:**

Build a model lumber pile using pieces of box lumber for miniature boards, and pieces of tree branch for foundation piers. Prepare a demonstration to show correct lumber stacking.

#### **Additional Helps:**

1. U. of M. Agric. Ext. Folder 104. *Better Lumber Through Good Piling*. 1947.

**Unit No. 6: Treat fence posts with preservative to make them last longer.**

**How to Do It:** Chances are you have helped Dad or an older brother build a new fence or repair one. Maybe you asked, "What makes fence posts wear out?"

By far the most common cause of wood-post failure is decay caused by wood-rotting organisms. They are called fungi. You know some kinds of fungi: the mold on bread and the blight on tomatoes, for instance. Wood-rotting fungi destroy wooden posts as they turn it into food.

A few kinds of wood have strong resistance to decaying fungi. These woods are described as "durable." Examples are white oak, bur oak, and northern white cedar. But only their heartwood is long lasting. Sapwood rots in a short time.



Position of sapwood and heartwood in the tree.

Good posts (having mostly heartwood) from durable woods are becoming scarce. On your farm you may already be using less durable posts. This unit describes how you can treat a nondurable wood with a wood preservative to increase its service life many times.

Aspen or "popple" trees are found in very great abundance over millions of acres in Minnesota. Today they are frequently used as fence posts, despite the fact they often rot and fail in 1 to 3 years. But aspen posts can be made to last 10-12 years if you give them a preservative treatment.

You will need the following materials:

1. Twenty-five green, unpeeled aspen posts. Fell trees measuring 4-6 inches in diameter and cut into the desired post lengths (6 to 7 feet).
2. A clean 55-gallon drum, watering tank, or similar container.
3. Twenty-four pounds of chromated zinc chloride.

This is the method to follow:

1. Dissolve the chromated zinc chloride in your container at the rate of 2 pounds to 1 gallon of water.
2. Saw off a 1-2 inch section from the butt end of each post just before standing it in the treating solution. The object is to have a fresh-cut surface.
3. Place the posts in the treating solution with butt ends down.
4. Allow posts to stand in the solution for two days. Keep the level of solution above the cut surface of the posts.
5. At the end of the second day, make a fresh cut at the top end of each post. Then turn it over and place the tops in the treating solution for one day.
6. Remove the posts and stand them on end with the butt end up for one month or more. Then they are ready for the fence line.
7. Set the posts in the ground unpeeled.

It is a good idea to identify the treated posts in the fence line by means of metal or wood tags. Then you can make accurate

observations on the condition of the posts from year to year. Include these items in your record form story:

1. A description of the condition of your farm fencing, the kinds of posts used, and the number needing replacement in the next two years.
2. The amount of treating solution taken up by the posts.
3. A sketch of your farm showing where the treated posts are set in the fence line.

Another kind of wood preservative you ought to know about is pentachlorophenol (everyone calls it simply "penta"). Send a request for Extension Folder 153, *Longer Lasting Fence Posts with Penta* to Bulletin Room, University of Minnesota, Institute of Agriculture, St. Paul 1, Minnesota. This folder describes another method of treating fence posts on the farm.

#### A 4-H demonstration on the preservative treatment of fence posts:

- Step 1. Prepare a chart illustrating the differences between sapwood and heartwood. Show why and how one is more durable than the other.
- Step 2. Make a model of fence posts and treating equipment.
- Step 3. Demonstrate how to treat aspen posts with chromated zinc chloride.



Project demonstrations are instructive both to you and to persons who see your presentation.

# A Word About Safety

Pictures courtesy of U. S. Forest Service

Some of you may be getting your first real experiences using woods tools like the ax, saw, and wedge. From the very beginning, learn the correct way of using these tools. The proper method will be the safest method. And remember this: tools do not cause accidents; it's the person who misuses or misplaces them.

## The Crosscut Saw

To carry a crosscut saw, remove one of the handles and put the blade across your shoulder with the teeth away from your neck.



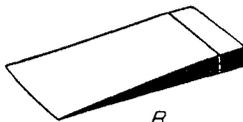
An uncovered saw can cause a nasty wound.

## The Wedge

Cast-iron wedges or cast-iron sledges should never be used. They are likely to chip, and the flying fragments can easily put out an eye. Metal wedges should be made of untempered steel.



A



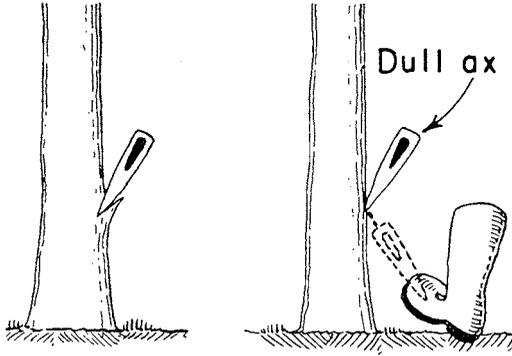
B

- A—a mushroomed head that should be ground off.  
B—wedge after grinding.

Under the constant pounding of a sledge hammer, wedge heads will gradually mushroom. Small pieces can chip off, fly through the air, and cause serious injury. Keep mushroomed tops ground or filed away.

## The Ax

An ax should be a keen-edged tool. A dull ax is dangerous because it glances off more easily than a sharp one. See the illustration below.



A dull ax is more dangerous than a sharp one.

up the head and pieces of steel may fly off and injure you and others nearby.

Carry an ax in one hand at the point of balance—near the head. Carrying it over your shoulder is very dangerous.

Keep track of your ax. Be careful where and how you lay it down. Accidents are caused by stumbling over or falling on a carelessly placed ax.

Never start chopping until you are sure there are no branches or brush in the way. A small branch or twig can deflect the ax head.

An ax is not a maul. Using the head of a single-bit ax to drive an iron wedge will batter

RIGHT  
POSITION



Safe and dangerous positions for limbing.



## *The Keep Minnesota Green Committee*

is happy to assist the Extension Service and 4-H Clubs in the publication of this forestry project bulletin.

Keep Minnesota Green is a voluntary citizens' committee dedicated to the prevention of destructive forest and grass fires and to the rebuilding of our forests through planting and tree farming. It was formed in 1944 because of a need recognized by conservation groups, industries, and public-spirited citizens. These people realized the urgent need for a nonpolitical organization working for the prevention of forest fires and other destructive fires and the rebuilding of our natural resources.

The Keep Minnesota Green organization functions locally through county committees, which are being organized in all interested counties. Your county agent and 4-H Club leader may be members and leaders in county Keep Minnesota Green programs. Your interest in the forestry projects covered in this bulletin will help your county Keep Green committee reach its goals of better fire protection and more interest in conservation.

This bulletin is the result of the type of cooperation that the Keep Minnesota Green committee feels is essential to protect our forests from fires and rebuild them to supply our demands for forest products. Such cooperation will help insure that future generations of fine young citizens, such as make up your 4-H membership, will have abundant timber, wild life, and other natural resources.

The committee stands ready to supply fire prevention posters, pamphlets, stickers, and conservation literature. Address all correspondence to Keep Minnesota Green, Inc., 555 Wabasha St., St. Paul 2, Minnesota.

