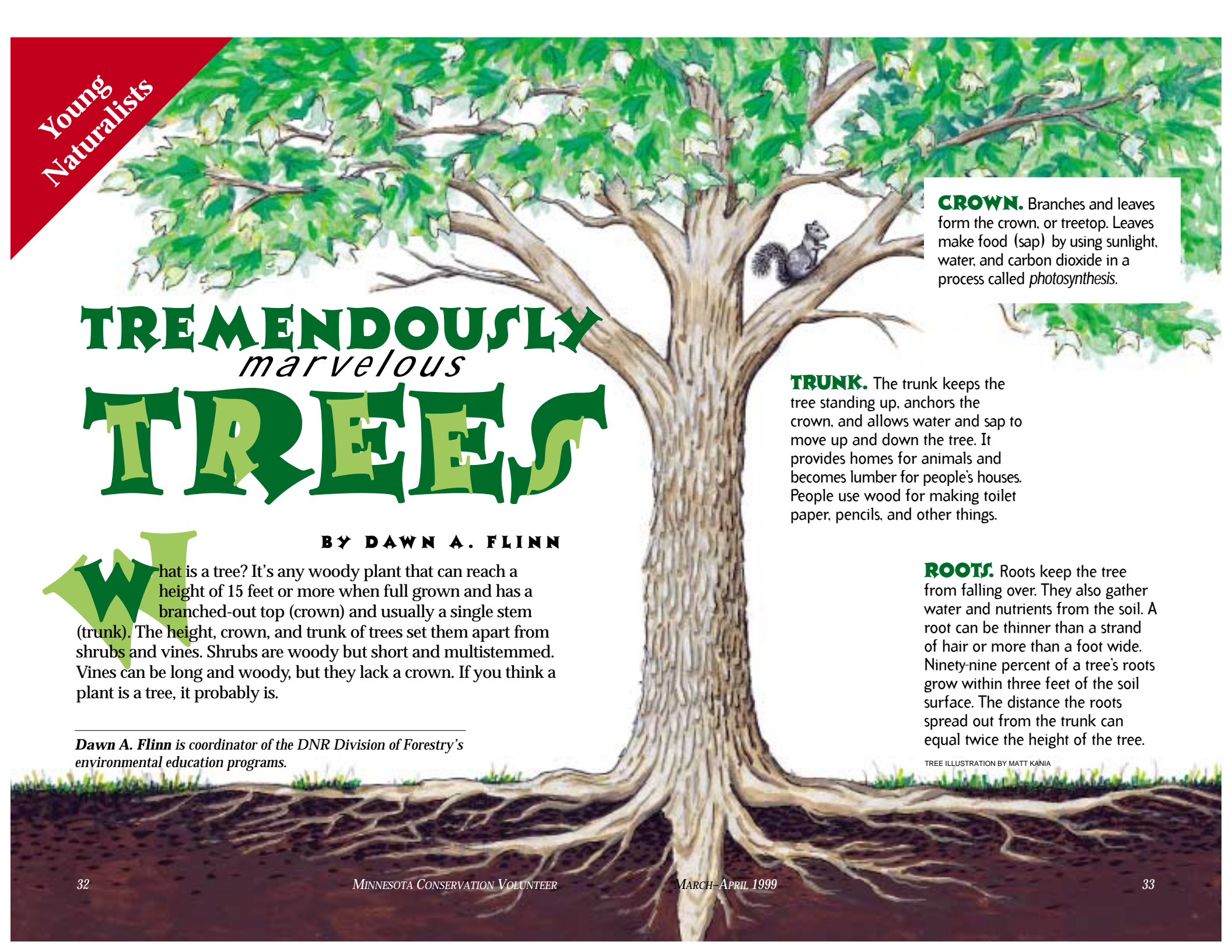


TREMENDOUSLY *marvelous* TREES

BY DAWN A. FLINN

What is a tree? It's any woody plant that can reach a height of 15 feet or more when full grown and has a branched-out top (crown) and usually a single stem (trunk). The height, crown, and trunk of trees set them apart from shrubs and vines. Shrubs are woody but short and multistemmed. Vines can be long and woody, but they lack a crown. If you think a plant is a tree, it probably is.

Dawn A. Flinn is coordinator of the DNR Division of Forestry's environmental education programs.



CROWN. Branches and leaves form the crown, or treetop. Leaves make food (sap) by using sunlight, water, and carbon dioxide in a process called *photosynthesis*.

TRUNK. The trunk keeps the tree standing up, anchors the crown, and allows water and sap to move up and down the tree. It provides homes for animals and becomes lumber for people's houses. People use wood for making toilet paper, pencils, and other things.

ROOTS. Roots keep the tree from falling over. They also gather water and nutrients from the soil. A root can be thinner than a strand of hair or more than a foot wide. Ninety-nine percent of a tree's roots grow within three feet of the soil surface. The distance the roots spread out from the trunk can equal twice the height of the tree.

TREE ILLUSTRATION BY MATT KANIA

WHAT'S INSIDE THE TRUNK?

XYLEM OR SAPWOOD. Xylem (say "zye-lum"), also called sapwood, is the layer that carries water and minerals up tiny pipelines to help nourish the entire tree.

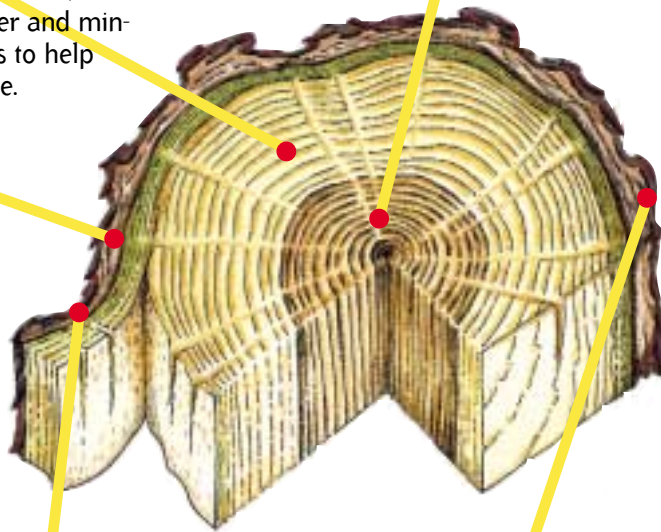
CAMBIUM. A thin layer of tissue called the cambium uses sap to make the trunk, branches, and roots grow thicker. Trees also grow from the tips of their branches. The cambium forms the xylem on its inner side and the phloem on its outer side.

PHLOEM OR INNER BARK. The phloem (say "flow-um"), or inner bark, transports sap down the tree from the leaves to feed the rest of the tree.

HEARTWOOD. In the center of the trunk is the heartwood. It supports the trunk and stores growing compounds and sugars, which help power the growth of leaves and twigs in the spring.

How old is this tree?
Count the rings and see.

OUTER BARK. This dead layer protects the tree from insects, disease, and lawn mowers. It stretches to allow the trunk and branches to grow thicker.



CROSS-SECTION ILLUSTRATION BY MATT KANIA

LEARN A LEAF, LEARN A TREE

More than 50 tree species are native to Minnesota. These native species took root here after the glaciers retreated from the northern United States about 10,000 years ago. The trees thrived because they fit the growing conditions, such as climate, type of soil, amount of moisture, and access to sunlight. We can divide our native trees into two main types: coniferous and deciduous.

To identify a tree species, look for the following clues in a leaf.

LEAF TYPE: Which one is it?

needles



scales



simple leaf



compound leaf

LEAF ARRANGEMENT: Which one is it?

opposite



alternate

LEAF EDGES: Which one is it?

smooth



toothed

lobed



doubly toothed

Leaf icons, twigs, leaves and seeds used with permission from A Beginner's Guide to Minnesota Trees, BU-06593 and Trees of Minnesota, BU-00486. Available from University of Minnesota Extension Service, 800-876-8636.

Four COMMON CONIFEROUS TREES

Conifers are often called softwoods. Scientists call them *gymnosperms* from the Greek word *gymnos*, meaning bare, and *sperma*, meaning seed. Conifers have uncovered seeds, which form on the scales of cones.

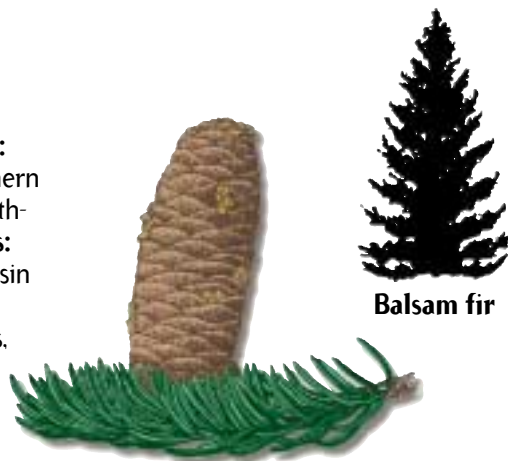
Conifers have needles, a type of leaf. Although the needles seem never to fall off, conifers do shed old needles a few at a time. Because new needles are waiting to replace old ones, these trees always look green—that's how they get the name *evergreen*. Conifer needles are a lot tougher than deciduous leaves and don't lose water as quickly, which means they can stay alive and green even in the winter.

Not all trees with needles are pine trees. Minnesota's native evergreens include spruce and fir too. How do you tell whether an evergreen is a pine, spruce, or fir tree? Look at the leaves. Pines have long, slender needles in groups of two to five. Spruces have four-sided, short, stiff, and sharp single needles. Firs have short, flat single needles.



FIR *Abies* species

Leaves: flat, single needles. **Fruit:** cones. **Location:** mostly in northern Minnesota, few scattered in south-eastern corner of the state. **Uses:** paper, Christmas trees. Sticky resin formerly used for mounting specimens on microscope slides, sealing birch bark, making varnishes. **Minnesota species:** balsam fir.



Balsam fir

TREE SILHOUETTES BY AMY BEYER, DNR GRAPHICS



White spruce



SPRUCE *Picea* species

Leaves: single, four-sided needles. **Fruit:** cones. **Location:** mostly in northern Minnesota. **Uses:** paper, canoe paddles, Christmas trees. **Minnesota species:** black and white spruce.



PINE *Pinus* species

Leaves: bundles of two or five needles. **Fruit:** cones. **Location:** mostly in northern Minnesota. **Uses:** lumber, cabinets. **Minnesota species:** jack, eastern white, and red pine, which is the state tree and also called the Norway pine.



White pine

TWIG, LEAF, AND SEED ILLUSTRATIONS, UNIVERSITY OF MINNESOTA EXTENSION SERVICE



Northern white cedar



CEDAR *Thuja* species

Leaves: scales. **Fruit:** cones. **Location:** mostly in northern Minnesota. **Uses:** lumber, cabinets. **Minnesota species:** northern white cedar. (The eastern red cedar is not a cedar but a juniper.)

SIX COMMON DECIDUOUS TREES

Deciduous trees are sometimes called hardwoods—even though the wood is not necessarily harder than that of softwoods (conifers). Deciduous trees such as oaks and maples lose their leaves in the fall. Scientists call these trees *angiosperms*. *Angio* comes from the Greek word for case. Angiosperms have covered seeds, such as acorns or berries.

OAK *Quercus* species



Leaf type: simple.



Leaf arrangement: alternate.



Leaf edges: lobed.



White oak

Fruit: acorns. **Location:** mostly in central and southern Minnesota. **Uses:** firewood, furniture, railroad ties. **Fall colors:** brown, yellow, red, purple-red. **Minnesota species:** black, bur, chinkapin, northern pin, northern red, swamp white, and white oak.

SIMPLE TREE GUIDES

A Beginner's Guide to Minnesota Trees is available from University of Minnesota Extension Service, 612-624-4900, or toll-free 800-876-8636. *Trees of Minnesota*, published by the Department of Natural Resources, is at Minnesota's Bookstore, 651-297-3000 or toll-free in Minnesota 800-657-3757.

TREE SILHOUETTES BY AMY BEYER, DNR GRAPHICS

MAPLE *Acer* species



Leaf type: simple.



Leaf arrangement: opposite.



Leaf edges: lobed.



Sugar maple

Fruit: samaras. **Location:** throughout Minnesota, most dense in central part of state. **Uses:** maple syrup, firewood, furniture, floors. **Fall colors:** bright red, orange, yellow, gold. **Minnesota species:** black, mountain, red, silver, and sugar maple and box elder.

ELM *Ulmus* species



Leaf type: simple.



Leaf arrangement: alternate.



Leaf edges: doubly toothed.



American elm

Fruit: samaras. **Location:** American elm grows throughout the state; other species are found mostly in the south. **Uses:** boats, furniture, farm tools. **Fall colors:** yellow. **Minnesota species:** American, rock, and slippery elm.

ASH *Fraxinus* species



Leaf type: compound.



Leaf arrangement: opposite.



Leaf edges: smooth or slightly toothed.






White ash

Fruit: samaras. **Location:** throughout Minnesota, except in the west. **Uses:** baskets, furniture, posts, sports equipment. **Fall colors:** usually yellow. **Minnesota species:** black, green, and white ash.

TWIG, LEAF, AND SEED ILLUSTRATIONS, UNIVERSITY OF MINNESOTA EXTENSION SERVICE

POPLAR *Populus* species




-  Leaf type: simple.
-  Leaf arrangement: alternate.
-  Leaf edges: toothed.

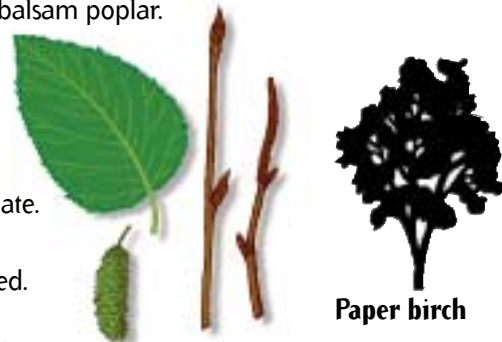


Quaking aspen

Fruit: capsules or catkins. **Location:** generally found throughout Minnesota. **Uses:** pulp for making paper, lumber, some wood fuel pellets. **Fall colors:** yellow. **Minnesota species:** bigtooth and quaking aspen, eastern cottonwood, and balsam poplar.

BIRCH *Betula* species

-  Leaf type: simple.
-  Leaf arrangement: alternate.
-  Leaf edges: doubly toothed.



Paper birch

Fruit: nutlet. **Location:** generally found throughout Minnesota. **Uses:** pulp for making paper, flooring, firewood. **Fall colors:** yellow. **Minnesota species:** paper, river, and yellow birch.

TREE TIME

On Arbor Day, April 30, many Americans will take time to learn about and plant trees. This American tradition began in Nebraska in 1872 when J. Sterling Morton, who believed that Nebraska needed more trees, began a campaign to set aside a day to celebrate trees. In 1876 Minnesota became the fourth state to adopt the tradition. Today we celebrate Arbor Day on the last Friday in April.

Since 1978 Minnesota has marked May as Arbor Month—a good time to plant trees because the ground has thawed and the weather has warmed enough to get young trees off to a good start. Minnesota is the only state that has dedicated a whole month to celebrating trees.

81 SCHOOL FORESTS

This year marks the 50th anniversary of Minnesota's school forest law, which allows public schools to create school forests. Today, 81 registered school forests offer natural settings where students learn about trees, soil, water, air, wildlife, land management, and environmental issues. These outdoor classrooms range in size from as small as a schoolyard to 353 acres (about 350 football fields).

C.V. Hobson, former geography professor at Bemidji State University, was instrumental in the passage of the law in 1949. The first school forest was established in 1952 at Blackduck. To learn more, see your local DNR forester or write DNR School Forest Program, 500 Lafayette Road, St. Paul, MN 55155-4044.

TRICKY TREE QUIZ

1. What part of the tree makes food for the tree?
a. bark
b. sapwood
c. leaves
2. Which type of tree drops the majority of its leaves in the fall?
a. deciduous
b. coniferous
c. both
3. What is Minnesota's state tree?
a. red oak
b. white spruce
c. red (Norway) pine
4. What month is Arbor Month in Minnesota?
a. April
b. May
c. October

ANSWERS: 1. c. 2. a. 3. c. 4. b.