

CMG GardenNotes #171

Identifying Trees and Shrubs

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Plant identification is a skill that takes time and patience to develop. The reward for developing this skill is confidence when communicating with clients, improved access to plant diagnostics materials (most based on plant identification) and the personal satisfaction of knowing the names of plants in the community. The steps to plant identification involve observation, questioning, and research, similar to the process learned in diagnosing tree disorders (*CMG GardenNotes* #102).

Colorado Master Gardeners are often asked to identify plants either over the phone or with a single leaf or plant part. Sometimes asking questions about the plant may provide the details needed for successful identification, but more than likely it will be necessary to ask the client to bring in a sample, including the stem and leaves with flower or fruit when possible.

For details on the taxonomic system, including use of scientific names, refer to *CMG GardenNotes* #122, **Taxonomic Classification**.

Plant Identification Tools

The most important skill used in successful plant identification is the ability to observe and define the characteristics of an individual plant. Examine the plant and note the structure and texture of stems, leaves, flowers and fruit, as well as any available roots. Remember to use visual clues as well as the feel and scent of the plant. However, use caution, as some plants or plant parts are known to be irritating or toxic.

Simple tools such as a hand lens, ruler, and a sharp blade (knife, scalpel or pruning shears) are helpful for examining plant parts. For more detailed work, a dissecting microscope is useful, especially for observing the details of flower parts.

Plants collected from landscapes or native sites (with permission only) can be stored in resealable plastic bags in the refrigerator for up to a week, or can be pressed between layers of newspaper for future reference.

There are many references available for plant identification, both print and electronic. While photo books are easy to use, they are often incomplete due to

lack of space. Websites often require that the user already know the name of the plant but they are useful to confirm identification or to obtain additional information regarding characteristics.

Plant Identification Keys

Keys are designed to systematically compare plant structures until the identification of a plant species is reached. Plant keys are generally the most complete and scientific references, consisting of a series of choices based on alternative plant characteristics.

Dichotomous style keys

A dichotomous key gives two choices at each step. Each couplet will compare variations in similar plant characteristics, such as

- 1a. Leaves narrow, less than ½ inch (2)
- 1b. Leaves wider than ½ inch (7)

Read both statements in the couplet and choose the statement that best describes the plant being examined. Notice that each statement is followed by a number in parentheses, which indicates the next step. If leaf width is less than ½ inch, move down to the couplet labeled 2a and 2b. If leaf width is more than ½ inch, skip couplets 2 through 6 and resume the process at 7a and 7b.

Outline style keys

In outline style keys, compare options at each indentation level. These lines may not be adjacent in line order. For example, from the key below the first choice would be A (needles single) or B (needles in clusters). If the needles were single, the next choice would be 1 (needles flat) or 2 (needles square).

- A. Needles single
 - 1. Needles flat in cross-section and flexible
 - a. Leaf scar oval, bud tips pointed – *Pseudotsuga* (Douglas fir)
 - b. Leaf scar round, bud tips roundish – *Abies* (fir)
 - 2. Needles square in cross-section and stiff – *Picea* (spruce)
- B. Needles in clusters of 2 or more – *Pinus* (pine)

Many key styles give you more than just two options to evaluate each level. Select the one that best describes the plant.

Terminology

The terminology of plant identification can be intimidating to the beginning, as well as the experienced, plant taxonomist. For example, ***Plant Identification Terminology: An Illustrated Glossary*** by James Harris, lists 35 terms that describe the hairs on the surfaces of stems and leaves. It is an excellent reference on plant terminology.

Fortunately, keys and photo references often contain a glossary with definitions of most of the botanical terms used in that publication. With practice, commonly

used words become familiar; however, many terms are used infrequently. A good taxonomist simply looks up the meaning of terms they are not familiar with. **Do not try to memorize the terms and meanings**, rather look them up as needed. For future reference, it is often helpful to draw a picture of a structure or paraphrase a definition in the margin of your book.

The Plant Identification Process

Plant identification is a process that begins with observing the plant as a whole, followed by evaluating the details of the plant parts. Gathering data and making notes of details before looking at references often saves time and frustration during the actual identification process. The details may seem trivial, but can play a major role in determining the species being identified.

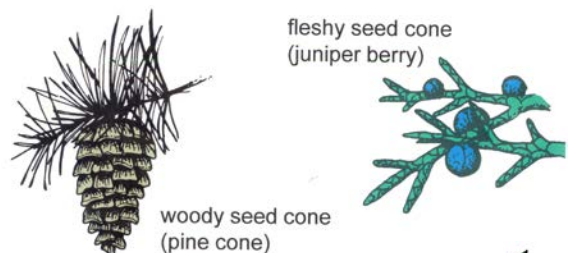
Step 1: Collect Information Regarding the Plant

A. Determine if the Tree/Shrub is a Conifer or a Broadleaf Flowering Plant

- **Conifers** are woody trees and shrubs generally with needle-like or scale-like foliage, and usually evergreen. Seeds are produced in cones, which are generally woody, (pinecone) but sometime fleshy and berry-like (juniper fruit). Examples include arborvitae, Douglas fir, fir, junipers, larch, pine, spruce, and yews. [Figure 1]

Conifers (members of the *Gymnosperms* along with ginkgos and cycads) do not flower, but produce seed in a structure made up of modified leaves called “bracts”. Gymnosperm means “naked seed” and refers to the exposure of the female reproductive structure during pollination rather than the actual seed being uncovered.

Figure 1. Woody and fleshy cones of conifers



- **Broadleaf flowering plants** (members of the *Angiosperms*) are a highly diverse group of plants that produce seed via flowers. This group includes woody trees, shrubs, and vines and is often referred to as broadleaf plants due to the flattened leaf blade. Flowers range from tiny and inconspicuous to large and showy. [Figure 2]



Figure 2. Broadleaf type leaf of Angiosperms

B. Determine if the Plant is Deciduous or Evergreen.

- **Deciduous** plants shed leaves in the fall. Most broadleaf flowering plants grown in Colorado’s climate are deciduous along with a few conifers such as

some *Larix* (larch).

- **Semi-evergreen** plants may retain some leaves, depending on winter temperatures and moisture.
- **Evergreen** plants retain leaves for multiple seasons. Leaves (needles) will be present throughout the year. Most conifers are evergreen, along with some broadleaf plants such as *Mahonia* (Oregon grape).

C. Determine the Growth Habit of the Plant.

Growth habit refers to the genetic tendency of a plant to grow in a certain shape and to attain a certain mature height and spread.

- **Trees** typically have a single trunk and mature height over 12 feet.
- **Shrubs** typically have multiple-branches from the ground and a mature height less than 12 feet.
- **Vines** have a climbing, clasping, or self-clinging growth habit.

Note: Many landscape plants could be considered small trees or large shrubs. The term “tree” or “shrub” would be applied based on the general appearance of the plant. The species, cultivar, or variety name sometimes indicates plant characteristic, including form.

Step 2 – Consult a Key to Lead You Through the Identification Process.

Each region of the county has a variety of keys written for trees in that region. Examples of keys for the Colorado region include the following:

- *Key to Common Landscape Trees and Shrubs of Colorado*, CMG GardenNotes #176 at www.cmg.colostate.edu/TreeID/156.html
- *What Tree Is This?* National Arbor Day Foundation, at www.arborday.org/trees/index-identification.cfm
- *Colorado Flora, Eastern Slope* by William Weber and Ronald Wittman
- *Colorado Flora, Western Slope* by William Weber and Ronald Wittman
- *Identification Key for Woody Plants of the Pikes Peak Region* by Colorado State University Extension, El Paso County
- *Trees and Shrubs of Colorado* by Jack L. Carter

CMG GardenNotes #172, **Identifying Conifers**, gives more details on identification of conifers. *CMG GardenNotes* #173, **Identifying Broadleaf Trees and Shrubs**, gives more details on identifying broadleaf flowering trees and Shrubs.

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