

Plant Identification

By Marty Wingate, Master Gardener, King County, Washington State University. Adapted for use in Kentucky by Richard Durham, consumer horticulture Extension specialist and state Master Gardener coordinator, University of Kentucky.

In this chapter:

Plant Names	01
Hybrids	02
Cultivars	02
Practicing Plant Identification	03

Learning about new plants is an exciting venture. Sometimes you are looking for a plant to fill a certain spot in your garden. At other times, you want to complete a particular color scheme, or your attention is caught by a magnificent tree, shrub, or perennial in a public or private garden. When you come across an unfamiliar plant, it can be frustrating to try to figure out what it is without knowing some of the botanical principles of plant identification.

The rules of plant identification and nomenclature (naming) may seem complex and more trouble than they are worth, but knowing the basic rules and applying them to everyday gardening leads to a better understanding of plants and how they are classified. Identification may be as simple as knowing that members of the mint family (*Lamiaceae*) have square stems. (Rub a stem of oregano or dead nettle between your fingers as a test.) Or identification may be as complicated as deciding among a series of choices that eventually lead to identification of the plant's genus and species. (This process is called "keying out," and it will be explained in more detail later.)

You'll be able to dazzle your family and friends by rattling off names such as *Liriodendron tulipifera* (commonly known as the tulip tree or tulip poplar and the current state tree of Kentucky) by learning about plant identification. You'll also be able to determine a plant's cultural requirements, ultimate size, flowering and fruiting habits, propagation methods, and common problems. Many insects and diseases are fairly host-specific; that is, they attack only certain species (and sometimes only certain varieties within a species) or certain genera. When you know a plant's genus and species, you can identify problems and make a diagnosis more easily, efficiently, and with more certainty. In fact, the first step in diagnosing a sick plant is to identify the plant.

Plant Names

Plants follow the same kind of classification system as do animals: kingdom, division, class, order, family, genus, and species. As gardeners, we are mostly concerned with the last three categories:

Family—A broad group of plants with common characteristics. The family name is written in plain text, its first letter is capitalized, and it ends in "aceae." For example, the nightshade family is Solanaceae. Common plants in this family include tomato, potato, pepper, eggplant, and tobacco. Some families may be listed using an older style; you may find the daisy family written as either Compositae or Asteraceae, for example. That's because sometimes taxonomists (people who make decisions about plant names) don't agree.

Genus (plural genera)—A category within a family that contains related species. Families may contain a few genera or many. For example, the monkey puzzle tree, *Araucaria araucana*, is one of only two genera in the family Auricaceae. The rose family (Rosaceae), on the other hand, includes more than 100 genera—everything from apples to spirea. Genus names are written in italics or are underlined, and the first letter is capitalized. For example, *Picea* is the genus for spruce.

Species—A population of individual plants within a genus that are capable of interbreeding freely with one another. For example, *Picea abies* is the species for Norway spruce.

Other terms also are important in plant identification:

Specific epithet—The second word in a plant name. (The word "species" refers to the plant, but the term "specific epithet" refers to the actual word in the name.) It is italicized, and the first letter is not capitalized.

Variety—A subset of a species. Varieties are populations of plants divided by geography and some significantly different characteristic. For example, *Rudbeckia fulgida*, the orange cone-flower native to North America, is a desirable perennial that, compared to many *Rudbeckias*, is less susceptible to powdery mildew. The variety *sullivantii* has exceptional three- to four-inch, bright yellow flowers. The popular cultivar 'Goldsturm' is a more compact form of this variety. The word "variety" can be abbreviated as "var.;" it is not italicized. Subspecies (ssp.) often is used in Britain with the same meaning.

Form—A naturally occurring characteristic that makes the plant different from other plants in the same population. For example, the pink-flowering dogwood, *Cornus florida* f. *rubra*, occurs naturally in its native habitat in the eastern United States, where it grows among the white-flowered form, which is more prominent.

Hybrids

A hybrid is a cross between two varieties or species, whether of the same genus or two different genera. F1 hybrids, common among annual vegetables and flowers, are highly controlled and manipulated. They are a cross between two lines within a species, each of which has been selected and repeatedly inbred for specific traits.

Hybrid names are written with an × between the genus and specific epithet. The latter word is made up, and often “media” is used.

Some hybrids occur in nature, such as *Arctostaphylos* × *media*, which is a cross between kinnikinnick (*A. uva-ursi*) and the taller growing *A. columbiana* and is found where the two parents grow in close proximity.

Hybridization is common in cultivation, as breeders look for better plants for our gardens. Sometimes, cultivated plants grow close enough together to cross on their own. ‘Eddie’s White Wonder’ is a cross between two native dogwood species: *Cornus nuttallii* and *Cornus florida*. ‘Arthur Menzies,’ an impressive winter-blooming evergreen shrub, was an accidental cross between *Mahonia bealei* and *Mahonia lomariifolia*.

Occasionally, an intergeneric hybrid occurs. The commonly planted Leyland cypress was an accidental cross between two species found at a nursery in England. The parents are the Monterey cypress, *Cupressus macrocarpa*, and the Alaskan cedar, *Chamaecyparis nootkatensis*. The correct way to write an intergeneric hybrid is to put the × before the genus. Leyland cypress is written as × *Cupressocyparis leylandii*. (The two generic names were combined.)

Cultivars

The term cultivar is short for “cultivated variety.” These are plants within a species that have been selected especially for a particular characteristic and propagated—usually asexually—to continue this characteristic. Bigger blooms, better color, larger fruits, and more compact growth are a few reasons a plant may be selected. The cultivar name is written in plain text and set off by single quotes.

Gardeners are familiar with cultivar names and often refer to plants by only the genus and cultivar, especially if the cultivar is the result of a hybrid cross. Thus we see *Penstemon* ‘Apple Blossom,’ *Fuchsia* ‘Santa Claus,’ and *Rhododendron* ‘PJM.’

Cultivars may arise from chance seedlings, selective breeding, or a sport (a spontaneous genetic change). The continuously blooming climbing rose ‘New Dawn’ was found as a sport of an old once-blooming climber, ‘Dr. W. van Fleet.’

Before 1959, cultivar names could be Latin or at least sound like it. *Viburnum opulus* ‘Roseum,’ the snowball viburnum, was named before 1959. After that, cultivars were named in modern languages, so you will find cultivars with Japanese, German, Dutch, or English names.



For a while, the practice was to anglicize cultivar names that English speakers found difficult to pronounce (or that were difficult to market to English speakers). This practice not only was unfair to breeders but caused a great deal of confusion. Now, growers and nurseries are encouraged to use the correct names, whatever the language. Thus, for example, the well-known *Penstemon* 'Garnet' should be listed as *Penstemon* 'Andenken an Freidrich Hahn.'

Keys are tools for classification and identification. When using a key, you move from general to more and more specific descriptions (and eventually to identification) by choosing among linked statements. These statements have descriptions, such as "leaves hairy" and "leaves smooth." Choosing the statement that more correctly describes a specific plant leads to a progressive narrowing of choices until you arrive at the name of the plant.

Keys are found in many plant identification books and on the Internet. Some include the whole range of flowering plant families; others cover only one genus, such as roses.

The paired statements in a key may be lettered or numbered. Sometimes the two statements are separated by a lot of space, since there are even more choices below each statement. See Table 2.1 for a brief example of a key.



Practicing Plant Identification

Practice—as always—makes perfect. The more you use botanical names for plants, the more quickly you will remember them and the less self-conscious you'll be when you say them. Here are some ways to learn and remember plant names:

- Say the names over and over, using any opportunity that comes along. Repeat the names of plants in your own garden, even when you are alone. Say aloud the names of plants you recognize in other gardens.
- Spend a little time each day on plant names. The names and characteristics of plants should become almost second nature.

Table 2.1. Example of a key.

I. Leaves opposite	1a. Leaves mostly less than 4 cm (15/8")	2a. Leaf margins toothed	3a. Leaf margins spiny-toothed	<i>Osmanthus delavayi</i>
			3b. Leaf margins crenate*	<i>Euonymus fortunei</i>
		2b. Leaf margins entire		<i>Buxus sempervirens</i>
	1b. Leaves more than 4 cm			<i>Viburnum davidii</i>
II. Leaves alternate	1a. Leaves mostly less than 6 cm (23/8")	2a. Stems armed (thorny)		<i>Pyracantha</i> species
		2b. Stems not armed	3a. Leaves oblanceolate*	<i>Pieris japonica</i>
			3b. Leaves ovate*	<i>Vaccinium ovatum</i>
	1b. Leaves greater than 6 cm	4a. Leaves ovate*		<i>Prunus lusitanica</i>
4b. Leaves obovate*		<i>Prunus laurocerasus</i>		

* Key: crenate = rounded scallops, oblanceolate = broad tip and tapering base, ovate = oval-shaped, obovate = oval-shaped with broadest part of leaf at the tip.

- Try to learn the meaning of the names so they make more sense to you. For example, *Acer macrophyllum* is the bigleaf maple (*macro* meaning “large” and *phyllum* meaning “leaf”). Color also plays an important part in plant names. A few examples are *Acer rubrum*, or red maple, which incorporates the Latin “rub” for red; *Symphoricarpos alba*, or snowberry, which uses the Latin “alba” for white; and *Ribes sanguineum*, or red-flowering currant, which uses the Latin “sanguin” for blood.
- When you look at plants, note identifying features such as leaf shape and arrangement, growth habit, and flower or fruit appearance. All these aspects help in correct identification. Refer to Chapter 1 for illustrations.
- Practice plant identification while visiting arboretums, nurseries, and public gardens (enjoyable in itself). These places often have plant tags or lists of plants.
- Practice using keys such as the one in *Dichotomous Keys for the Arboretum Walk* (<https://www.uky.edu/hort/sites/www.uky.edu/hort/files/pages-attachments/treekeys.pdf>)

Cooperative Extension Service

Agriculture and Natural Resources
Family and Consumer Sciences
4-H Youth Development
Community and Economic Development

MARTIN-GATTON COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT

Educational programs of Kentucky Cooperative Extension serve all people regardless of economic or social status and will not discriminate on the basis of race, color, ethnic origin, national origin, creed, religion, political belief, sex, sexual orientation, gender identity, gender expression, pregnancy, marital status, genetic information, age, veteran status, physical or mental disability or reprisal or retaliation for prior civil rights activity. Reasonable accommodation of disability may be available with prior notice. Program information may be made available in languages other than English. University of Kentucky, Kentucky State University, U.S. Department of Agriculture, and Kentucky Counties, Cooperating.
Lexington, KY 40506 Revised 01-2024



Disabilities
accommodated
with prior notification.