

# Flower Guide

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# DRAFT

## Definitions

### Types of flowering plants

- **Monoecious:** Refers to a plant or plant species that has separate male (staminate) and female (pistillate) flowers that occur on the same plant. Example: *Betula nigra* (River Birch).
- **Dioecious:** Refers to a plant or plant species with imperfect flowers, with male and female flowers occurring on separate plants. Example: *Populus deltoides ssp. deltoides* (Eastern Cottonwood).
- **Polygamodioecious:** Refers to a plant or plant species that has some individuals that are male, some female, and some monoecious. Example: *Acer rubrum* (Red Maple).

### Types of flowers

- **Perfect/Hermaphroditic:** Describes a flower having both pistil and stamens; bisexual.
- **Imperfect:** A flower having only one set of sexual organs; unisexual.
- **Pistillate:** Refers to a female flower that has only functioning female reproductive parts, or if male reproductive parts (stamens) are present, they are non-functioning.
- **Staminate:** Refers to a male flower that has only functioning male reproductive parts, or if female reproductive parts (pistils) are present, they are non-functioning.

### Flower parts

- **Pistil:** The female reproductive part of a flower made up of the ovary, style (stalk) and stigma (sticky tip that receives pollen).
- **Stamen:** The male reproductive part of a flower made up of a filament (stalk) and anthers (contain pollen).
- **Perianth:** The envelope that surrounds the reproductive parts of a flower.
  - **Calyx:** The outer perianth of a flower.
  - **Sepal:** A division or lobe of the calyx
  - **Corolla:** The inner perianth of a flower.

- **Petal:** A division or lobe of the corolla
- **Bract:** a modified leaf that can appear leaf-like or petal-like.
- **Involucre:** A whorl of bracts that surround a flower head
- **Pedicel:** A flower stalk of a single flower within an inflorescence
- **Peduncle:** The stem that supports the entire inflorescence

### Inflorescences

Inflorescences are groups or clusters of flowers arranged on an axis or stem that is composed of a main stalk.

- **Indeterminate:** The youngest flowers are at the top of an elongated axis or on the center of a truncated axis. Catkins, panicles, racemes, and spikes are examples of indeterminate inflorescences.
  - **Catkin:** An inflorescence of very densely clustered flowers in a spike-like form, often hanging down, and often having flowers of just one sex.
  - **Panicle:** An indeterminate inflorescence consisting of a central axis bearing racemes as secondary units, or a more general branching structure composed of racemes. The term is sometimes applied to any sort of a loose, branching cluster.
  - **Raceme:** A simple, indeterminate inflorescence consisting of stalked flowers attached to a central stem and forming a more or less elongated cluster.
  - **Spike:** A type of raceme in which the flowers develop directly from the stem and are not borne on pedicels.
- **Determinate:** A terminal flower opens first, followed by flowers lower on the branch. Multiple levels of branching are frequently involved.
  - **Cyme:** A flat-topped determinate inflorescence in which the central flowers open first, followed by the peripheral flowers.

### Additional terms

- **Capitate:** Re an inflorescence: With the flowers unstalked and aggregated into a dense cluster.
- **Fascicle:** A cluster of flowers growing close together.

### Tree Spotter Trees

Scientific name	Common name	Type of flower	Description	Typical bloom time	Comments
<i>Acer rubrum</i>	Red Maple	Polygamodioecious Perfect/Hermaphroditic Staminate fascicle Pistillate raceme	<p>The ¼” pink to dark red flowers have 5 small petals and 5 sepals borne in dense hanging clusters.</p> <p>The style of the pistillate flowers splits into 2 parts and develops stalks up to 2” long that protrude beyond the perianth.</p> <p>Staminate flowers are not stalked. They have scaly bracts and 4 -12 stamens with long filaments featuring anthers with a dark stripe.</p>	March and April	<p>An individual tree may be all male, all female, have both types of flowers (each type occurring on a separate branch), or the flowers may be functionally bisexual.</p> <p>Under the proper conditions, a tree can switch from male to female, male to hermaphrodite, and hermaphrodite to female.</p> <p>Flower clusters appear on last year’s twigs; when both sexes are on the same tree, they will be on different branches.</p> <p>Both male and female flowers typically open before the leaves appear.</p>
<i>Acer saccharum</i>	Sugar Maple	Monoecious	Long-pedicelled, petal-less yellow	Between early April	Flower buds usually begin to swell at or slightly before the leaf

		Perfect (but usually only one sex is functional within each flower)	flowers, about 2 ½" long.	and mid May	buds show activity and reach full bloom 1-2 weeks before leaves emerge.  Flowering in sugar maple is polygamous, occurring over the entire crown. Flowers of both sexes are typically produced in the upper part of the crown but often only males form in the lower part. In some trees, certain major limbs produce only male and others only female flowers.
<i>Aesculus flava</i>	Yellow Buckeye	Perfect/Hermaphroditic Panicle	Yellow-green inflorescence about 7" long x 3" wide, composed of an upright panicle of many solitary pale yellow-orange tube-shaped flowers.	Between late March and early June	The inflorescence rises clearly above the expanded foliage.
<i>Betula alleghaniensis</i>	Yellow Birch	Monoecious Imperfect Catkin.	Male florets occur in groups of 3 behind each bract; each male floret consists of 2 stamens. The oval-shaped bracts have hair-like	Between early April and early June	Female and male catkins are borne separately on the same branch.  The male catkins occur in clusters of 3-6 on the previous year's growth. During the blooming period, they droop downward

			<p>extensions along the margins.</p> <p>Female florets occur in groups of 3 behind each bract; each female floret consists of a naked ovary and a pair of styles. The bracts are ¼-½" long, 3-lobed and have hair-like extensions along the margins.</p>		<p>and become 2½-4" long and yellowish purple. Each male catkin consists of numerous male florets and their bracts.</p> <p>The female catkins are small, greenish, rounded, and erect. They occur individually on short spur twigs near the petioles of leaves. They grow to ¾-1¼" long at maturity. Each female catkin consists of numerous female florets and their bracts.</p> <p>The blooming period occurs during late spring for about 1 week.</p>
<i>Betula nigra</i>	River Birch	Monoecious Imperfect Catkin	<p>Individual male florets are less than ⅛" long, each one consisting of a tiny calyx with 4 lobes and a pair of stamens. In each catkin, the male flowers are partially obscured by tiny bracts.</p>	<p>Between early March and late April</p>	<p>Female and male catkins are borne separately on the same branch.</p> <p>Male catkins are brownish yellow and appear at the ends of twigs in groups of 2-5. In the spring, they swell, turn golden, and unfold and lengthen as buds mature. Each male catkin consists of numerous male florets and their bracts.</p>

			Individual female florets are about 1/8" long, each one consisting of a naked ovary with a pair of styles; neither a calyx nor petals are present. The female flowers are partially obscured by 3-lobed bracts; the narrow lobes of these bracts are nearly equal in size.		Erect female catkins develop from short spur twigs along the branches; they are 3/4-1 1/4" long, 1/2" across, narrowly ovoid in shape, and covered with fine hairs. They are usually flanked by leaf buds that become more apparent as spring progresses. Each female catkin consists of numerous female florets and their bracts.
<i>Carya glabra</i>	Pignut Hickory	Monoecious Imperfect Staminate catkin Pistillate spike	Each male floret is very small (1/8" " long or less), consisting of a calyx with several stamens that is partially covered by a bract with 3 lobes.  Each female floret is very small (1/8" long or less) and inconspicuous, consisting of a green pistil and a few	Between early April and late May	The drooping staminate catkins (about 2-4" long) are arranged in bunches of 3 and develop from axils of leaves of the previous season or from inner scales of the terminal buds at the base of young shoots. The catkins are greenish yellow and narrowly cylindrical in shape. They usually emerge before the pistillate flowers.  Clusters of 2-5 pistillate spikes containing the female florets

			narrow pointed bracts.		appear at the tips of young shoots.  The blooming period occurs from mid- to late spring for about 2 weeks.
<i>Carya ovata</i>	Shagbark Hickory	Monoecious Imperfect Staminate catkin Pistillate spike	Individual male flowers are less than 1/8" across, consisting of several stamens and an insignificant calyx; each male flower is partially hidden by a 3-lobed bract.  Individual female flowers are about 1/8" long and ovoid in shape, consisting of a calyx and a pistil with spreading stigmata at its apex.	Between mid April and late May	The male flowers are produced in drooping yellowish green catkins near the tips of twigs; these catkins are arranged in groups of 3 (catkins in each group sharing the same basal stalk) and they are 3-6" long.  The female flowers are produced in short greenish spikes (about 1/3" long) at the tips of young shoots. There are typically 2-3 female flowers per spike.  The blooming period occurs from mid- to late spring as the leaves develop.
<i>Hamamelis virginiana</i>	Common Witch-Hazel	Perfect/Hermaphroditic A few-flowered inflorescence with capitate spikes in the axis of the leaves	The flower buds arise from axils of the leaves of the current year, or from latent buds of the two preceding years,	October through December	Typically sheds its leaves before flowering begins. The stigmas are receptive at approximately the same time the anthers are open.

			<p>and typically appear early in May.</p> <p>Each flower bud produces a head of two to four flowers, and there are often as many as three buds per axil. Each flower consists of four, long, slender, bright yellow petals, alternating with four short stamens.</p>		<p>Insect pollinated, self-incompatible.</p> <p>Flowers can persist for weeks, even several months, furling in the cold at night and unfurling with even a little sunny encouragement.</p>
<i>Fagus grandifolia</i>	American Beech	<p>Monoecious Imperfect Staminate catkin Pistillate spike</p>	<p>The round, pendulous male flowers appear in ¾-1" diameter yellowish heads hanging on 1-3" long stalks. They have sepals that are united and 6 or more stamens.</p> <p>The petal-less yellowish-green egg-shaped female flowers are about ¼"</p>	Between early April and late May	<p>Beech flowers appear in late April or early May when the leaves are about one-third grown.</p> <p>The flowers are quite vulnerable to spring frosts.</p>

			long and occur in clusters of 2-4 on a short spike. They have distinct sepals and 3 carpels and styles. They are surrounded by reddish bracts that form a bur-like structure.		
<i>Populus deltoides ssp. deltoides</i>	Eastern Cottonwood	Dioecious Imperfect Catkin	<p>Each male floret consists of a dish-shaped basal disk and 20-60 reddish or yellowish stamens. At the base of each male floret, there is a fringed bract The florets are reddish in color and while smaller, are more conspicuous than the female flowers.</p> <p>Each female floret consists of a dish-shaped basal disk and a single</p>	Between mid March and mid May	<p>Male catkins range in size from 3-5" long and occur in clusters of 2-4 near the tips of branches. They develop earlier than female buds and are much larger, reddish in color, and cylindrical in shape, consisting of a dense mass of male florets.</p> <p>Male trees tend to flower a few days earlier than female trees.</p> <p>Female catkins range in size from 6-8" long and are produced individually. Each female catkin is green and cylindrical in shape, consisting of many female florets on slender petioles</p>

			<p>ovoid pistil about 1/3" long. Each pistil has 3-4 flattened stigmata with wavy margins. At the base of each female floret, there is a fringed bract.</p>		<p>Both male and female flowers open before the leaves appear.</p>
<i>Quercus alba</i>	White Oak	<p>Monoecious Imperfect Staminate catkin Pistillate spike</p>	<p>Individual male flowers are yellowish, 1/8" across or less, and consist of an irregularly lobed calyx and several stamens.</p> <p>Female flowers are reddish green and appear as very small single spikes on very short peduncles (less than 1/8" long). Individual female flowers are 1 1/8" across or less.</p>	<p>Between late March and late May</p>	<p>The male flowers are produced in greenish yellow catkins about 2-3 1/2" long that develop near the tips of last year's branches. They appear about 5-10 days before the reddish pistillate flowers.</p> <p>Female flowers form either singly or in pairs at the tips of new shoots.</p> <p>Female flowers that are not fertilized abscise during the development period.</p> <p>Flowers at about the same time leaves appear. The blooming period lasts about 1-2 weeks.</p> <p>Spring air temperatures strongly affect acorn yields. In addition,</p>

					<p>ripe anthers open and close with changes in relative humidity. Normally, pollen dissemination is completed within 3 days, but periods of wet weather delay pollen shedding. Dry winds and freezing weather are also detrimental to flower development and pollen shedding.</p>
<i>Quercus rubra</i>	Northern Red Oak	Monoecious Imperfect Staminate catkin Pistillate spike	<p>Individual male flowers are less than 1/8" across, consisting of several stamens and a calyx that are partially hidden by hairy bractlets.</p> <p>Female flowers are produced either individually or in clusters of 2-5. Each female flower is about 1/8" across, ovoid in shape, consisting of an ovary with recurved stigmas that is surrounded by a</p>	Between early April and early June	<p>The male flowers are arranged in drooping yellowish green catkins about 2-4" long that develop from leaf axils of the previous year and emerge before or at the same time as the current leaves. These catkins often occur in groups of 3.</p> <p>The pistillate flowers are solitary or occur in two- to many-flowered spikes that develop in the axils of the current year's leaves.</p> <p>The short blooming period occurs either shortly before or during the unfolding of the vernal leaves.</p>

			form-fitting calyx. Underneath each female flower are several bractlets.		Individuals may not produce catkins every year.
<i>Tilia americana</i>	American Linden (aka Basswood)	Perfect/Hermaphroditic Cyme	The fragrant, yellow-white flowers are borne on loose cymes. Each cyme droops from a showy, papery, narrow, light green leaf-like bract, which can be up to 5" long.	Between mid June and mid July	Flowering follows initial leaf-out and lasts approximately 2 weeks. During this period, all stages of floral development are present on a single tree or even in a single inflorescence (4-40 flowers per inflorescence).
<i>Vaccinium corymbosum</i>	Highbush Blueberry	Perfect/Hermaphroditic Raceme	The flowers are long bell- or urn-shaped, white to very light pink, and about $\frac{1}{3}$ of an inch (8.5 mm) long.  Each flower consists of a tubular corolla with 5 short broad teeth along its outer rim that are recurved, a short light green calyx, 10	Starting in late April through early May and lasting for about 2 weeks	Small clusters of nodding flowers are produced from either lateral or terminal shoots, often in succession along individual branches.  Self-fertile, but cross-pollination increases fruit amount and size.

			<p>stamens, and a pistil with a single style.</p> <p>The pedicels of the flowers are light green to red and up to ½" in length. The pedicel bases have conspicuous bracts that are light green to red and elliptic to ovate in shape.</p>		
<p><i>Viburnum cassinoides</i> (aka <i>Viburnum nudum</i>)</p>	<p>Withe-Rod</p>	<p>Perfect/Hermaphroditic Cyme</p>	<p>Creamy white flowers borne in flat-topped dense clusters usually about four inches wide. The individual flowers are white, 1/4 inch wide, with five petals and five stamens topped with yellow anthers, giving the flower cluster a creamy glow.</p>	<p>Late June</p>	<p>Insect-pollinated.</p> <p>Not self-fertile.</p>