Tree Spotters Phenophase Guide

RED MAPLE
Acer rubrum

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Breaking leaf buds

Description
• One or more breaking leaf buds are visible on the tree.
• A leaf bud is considered breaking once a leaf tip is visible at the end of the bud, but before the first leaf has unfolded to expose the petiole (leafstalk).

Look for
• Pale yellow-green leaf tips visible at the end of vegetative buds.
• Flowers emerge first from the flower buds. Once they are spent, the leaf buds begin to break.

Clarification
• Unlike Acer saccharum, Acer rubrum buds contain either flowers or leaves, not both. The vegetative buds, which contain only leaves, start to open after most of the flowers have finished the “open flowers” phenophase.

Notes
• Continue to report any breaking leaf buds you see throughout the season.

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Leaves

Description
• One or more live, unfolded leaves are visible on the tree.
• A leaf is unfolded once its entire length emerges from a breaking bud and the point where the petiole attaches to the stem is visible.

Look for
• Petiole visible at the point at which it is attached to the stem.

Clarification
• Continue to report leaves from the time the first leaf unfolds until there are no leaves left on the tree.
• Do not include fully dried or dead leaves.

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**Increasing leaf size**

**Description**
- A *majority* of leaves on the tree have not yet reached their full size and are still growing larger.

**Look for**
- Many leaves that are still growing.

**Clarification**
- Increasing leaf size begins with the first unfolded leaf and ends when over 50% of leaves from that first flush have expanded to their full mature size.
- As they expand, leaves will often gradually change color from a lighter to a darker green and may change from a soft, thin texture to a tougher mature texture.
- **Do not** include new leaves that may emerge at the ends of elongating stems throughout the growing season.

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Colored leaves

Description
One or more leaves:
• Show late-season deep red and burnt orange colors.
• Are yellow or brown due to drought or other stresses.

Look for
• Leaves that are turning red or orange or have turned those colors.

Clarification
• Do make a note in the comments field when leaves are yellow or brown due to stress.

• Do not include:
  • Small spots of color due to minor leaf damage.
  • Dieback on branches that have broken.
  • Fully dried or dead leaves that remain on the tree.
**Falling leaves**

**Description**
- One or more leaves are falling or have recently fallen from the tree since your last observation.

**Look for**
- Colored leaves on the ground.

**Clarification**
- Summer wind storms often cause a few handfuls of healthy green leaves to fall. Do not report these as “Falling leaves”.
- Leaves may stop falling during a spell of mild weather. Report ”No” to “Falling leaves” if none appeared to fall from the tree since your last observation, even if you previously reported “Yes”.

**Note**
- Your last “Yes” observation of the season will likely be “Yes “to “Falling leaves”: No leaves are left on the tree, but you observe leaves on the ground that were not there on your previous visit.
Flowers or flower buds

Description
• One or more flowers or unopened flower buds are on the tree.
• Bundles of flower buds include small flowers that open over a period of days.

Look for
• Bundles of red flower buds that expand into clusters of flowers.

Clarification
• Flowers generally appear several weeks before the leaf buds break.
• Do not include wilted or dry flowers, as shown here.
**Open flowers**

**Description**
- One or more open, fresh red flowers are visible on the tree.
- Flowers are considered open when the reproductive parts (female pistils and styles or male stamens) are visible between unfolded flower parts.

**Look for**
- Clusters of red flowers with either pistils and styles (female flowers) or stamens (male flowers) visible.

**Clarification**
- Red maples have separate male and female flowers.
- Generally a tree will have only one type of flower, although that is not always the case. (For more information, refer to the article by Richard Primack in the appendix.)

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**Pollen release**

**Description**
- One or more flowers on the plant release visible pollen grains when gently shaken or blown into your palm or onto a dark surface
- A cloud of pollen can be seen in the air when the wind blows.

**Look for**
- Pollen grains on the tips of the anthers of male flowers.

**Tip**
- Bring along a piece of black paper and gently shake a male flower above it to dislodge the pollen.

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Fruits

Description
• Female flowers rapidly develop into winged fruits composed of a pair of slightly divergent flattened samaras about ½ to ¾ inches long.
• The samaras mature in the spring before leaf development is complete.

Look for
• Flattened winged samaras, each about 3/4 inches long, often hanging in small clusters.

Clarification
• You will not find fruit on a tree that has produced only male flowers.
• These trees have the potential to produce both male and female flowers, however, so the type of flowers you see on a tree can vary from year to year. Therefore you should check all of our Acer rubrum specimens for fruit, even if you aren’t expecting to see any.
Ripe fruits

Description
• Ripe samaras are light brown.
• The paired samaras fall in the spring, soon after ripening.

Look for
• Small tan or light brown winged samaras.

Note
• Both samaras may contain seeds, only one may contain a seed while the other is empty, or both may be empty.

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Recent fruit drop

Description
• One or more ripe fruits (samaras) are visible on the ground.

Look for
• Samaras lying on the ground under the tree.

Clarification
• Do not include obviously immature fruits that have dropped before ripening, such as during a heavy rain or wind storm.

Note
• The wind can blow samaras far from the tree, so do your best to verify that the samaras you are seeing belong to the tree you are observing.

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Appendix A: Dormant Buds

Description

• At this time we are not officially observing dormant buds. If you are interested in the development of the *Acer rubrum* flowers over the course of the year, however, feel free to include those observations in the Comments section of the “Flowers or flower buds” phenophase.

Note

• In the spring, when the tree is ready to flower, the dormant vegetative (leaf) buds swell, the bud scales shift, and the buds elongate, making the tips more pointed. This is an indication that it won’t be long before the leaf buds begin to break, so you will want to visit these trees more often if you can.
Credits
• Phenophase Guide Team: Betsey Henkels, Karen Owens Linehan, Suzanne Mrozak, and Julie Whelan
• Photos: Unless otherwise noted, all photos were taken by Karen Owens Linehan or Suzanne Mrozak.
• Species timeline by Danny Schissler.

References
• The sex life of the Red Maple by Richard Primack
• NPN Phenophase Primer for Plants (Current draft)
• USDA Plants Database
• Sylvics Manual Volume 2: Hardwoods

Questions, Comments, Suggestions?
• Email TreeSpotters@fas.harvard.edu

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