

# PLANT TERMS – Buds

[V. Max Brown]

A **Bud** is a vegetative shoot or flower (or both) that has not yet developed. It is a growing region (meristematic tissue) that is often enclosed by undeveloped (immature) or special protective leaves (termed **Bud Scales**) – some buds are without protective scales and are termed **Naked Buds**. Buds form at the apex of the stem and are termed **Terminal Buds** and those that occur in the axils of leaves are termed **Lateral** or **Axillary Buds**. **Adventitious Buds** (Buds arising from unusual sources or in unusual positions) may arise from near where wounds occur on a stem or from roots and leaves.



**Terminal Bud** – some species have a true terminal bud, others have a **tip-scar** and the nearest lateral bud takes the place of a terminal bud – the herbaceous plant to the right was already in flower (terminal bud had already opened but not the lateral buds shown)

**Internode**

**Lateral or Axillary Bud(s)** – buds found at **stem nodes** in axils of leaves – Buds then will be described by position - as alternate, opposite or whorled



The following discussion of buds (and other parts) will be primarily involved with perennial species that develop buds during resting phases (non-growth times) such as winter (extreme cold) or during extremely dry seasons. The greatest variety of Buds are best developed in the woody species of shrubs and trees and affords the naturalist a great time to be in the field identifying many species (although some will give challenges)

# PLANT TERMS – Lateral Buds, Leaf Scars, and Bundle Scars

[V. Max Brown]



Very large **bundle scar**, almost reaching around stem



The **Lateral Bud** is above the Leaf Scar

**Bundle Scars** – the scar or trace of vascular bundles (like veins) that feed the leaves – the number and arrangement is sometimes used to ID species, may be indistinct



**Leaf Scar** – the place where the old leaf was attached to the stem.



**Accessory 'extra' Superimposed Buds** – sometimes an additional bud occurs above the normal lateral bud

**Accessory 'extra' Collateral Bud(s)** – additional lateral buds may also occur on either side of the normal lateral bud



# PLANT TERMS – Lateral Buds, Leaf Scars, Bundle Scars, and Lenticels

[V. Max Brown]



1 years growth

**Terminal Bud-Scale Scars** – These multiple scars from **bud scales** record the position of the terminal bud in previous years – eventually they will be destroyed by horizontal growth – for a few years, yearly growth can be measured



**Lenticels** – round to lens-shaped, raised corky area on stems, some may have a breathing function



Some species have **Stipules** (a pair of leafy appendages found at the base of a leaf petiole) which may persist into winter with some species (if so may be important in ID)



**Stipules**



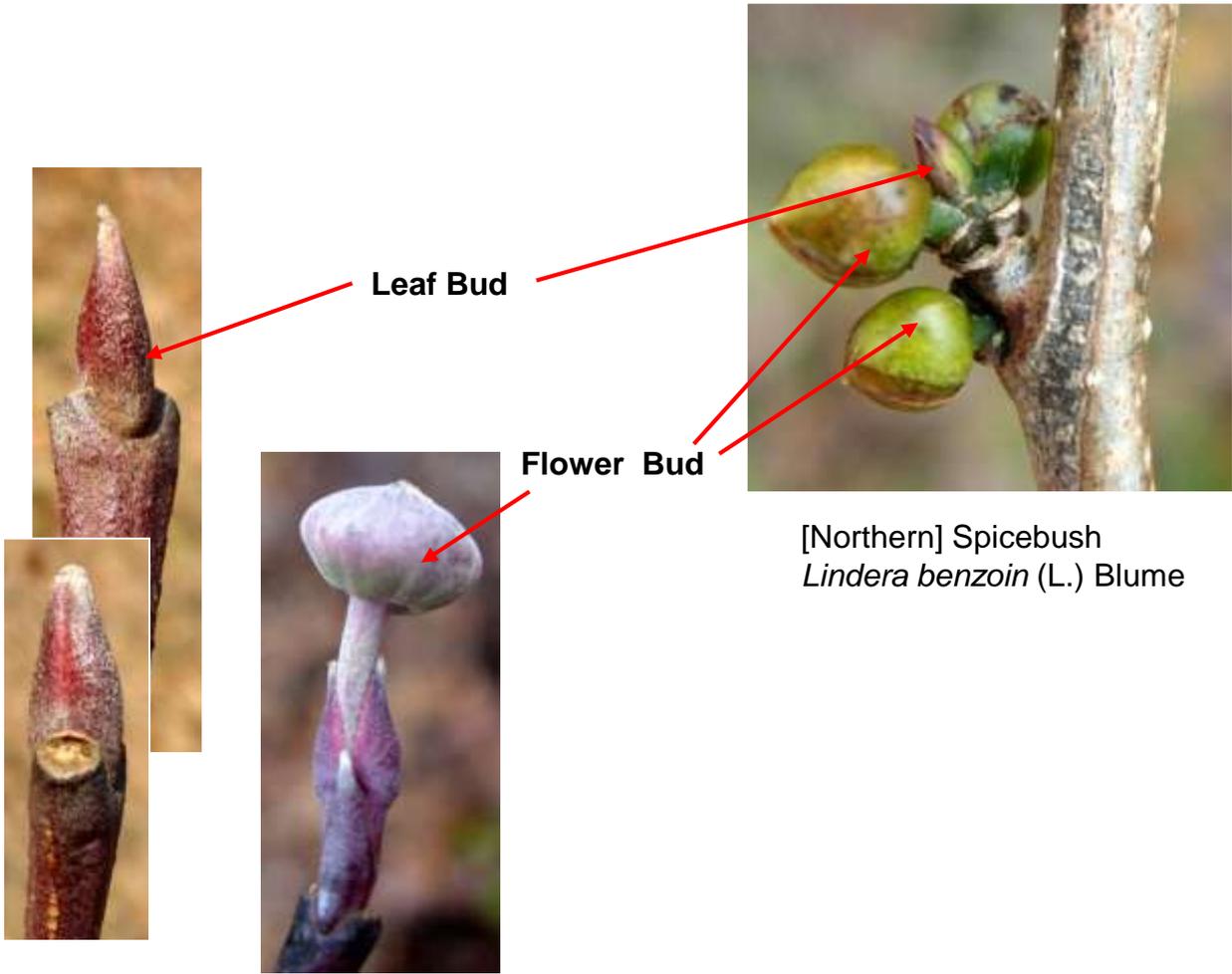
Small **Stipule Scars** are then sometimes present on either side of the leaf scar

# PLANT TERMS – Lateral Buds, Leaf Scars, and Bundle Scars

[V. Max Brown]

**Buds** may be **vegetative buds** (leaf buds), **flower buds** (usually larger, borne on old wood), or **mixed buds** (leaf & flower) depending on the species.

Another type of flowering structure (flower buds) is a **Catkin** or **Ament** – a raceme or spike of unisexual flowers without petals



Flowering Dogwood *Cornus florida* L.

[Northern] Spicebush  
*Lindera benzoin* (L.) Blume



[American] Hazelnut  
[Hazel] *Corylus americana* Walt.



Speckled [Black, Tag] Alder  
*Alnus incana* (L.) Moench ssp. *rugosa* (Du Roi) Clausen

# PLANT TERMS – Terminal Buds

[V. Max Brown]



**Terminal Bud** – Many species have a **True terminal bud** such that when the bud develops there is no longer any elongation in growth until growing conditions are more favorable. Often the Terminal Bud is somewhat larger than lateral buds. Sometimes they seem missing but are just buried in the twig. All the terminal buds above have a covering of two or more **Scales** (tough outer leaf-like protective structures) **that protect** the embryo leaves and possible flowers within. These scales are termed **Valvate** if there are 2 scales that meet in the middle and **Imbricated** if there are more than 2 and overlap each other. Sometimes, rarely, there is only one scale that hides the leaves and/or flowers against the stem.

Buds **A** to **C** show no or few hairs (glabrous) and are glaucous. Bud **D** is finely hairy and angled. Bud **E** is densely hairy and bud **F** is covered with tiny yellow scales. Bud **G** has a waxy like substance on the scales to help protect the bud.

**Collateral (Accessory)**  
Multiple buds crowd other buds at tip of an oak twig.



# PLANT TERMS – Naked Buds and False Terminal Buds

[V. Max Brown]

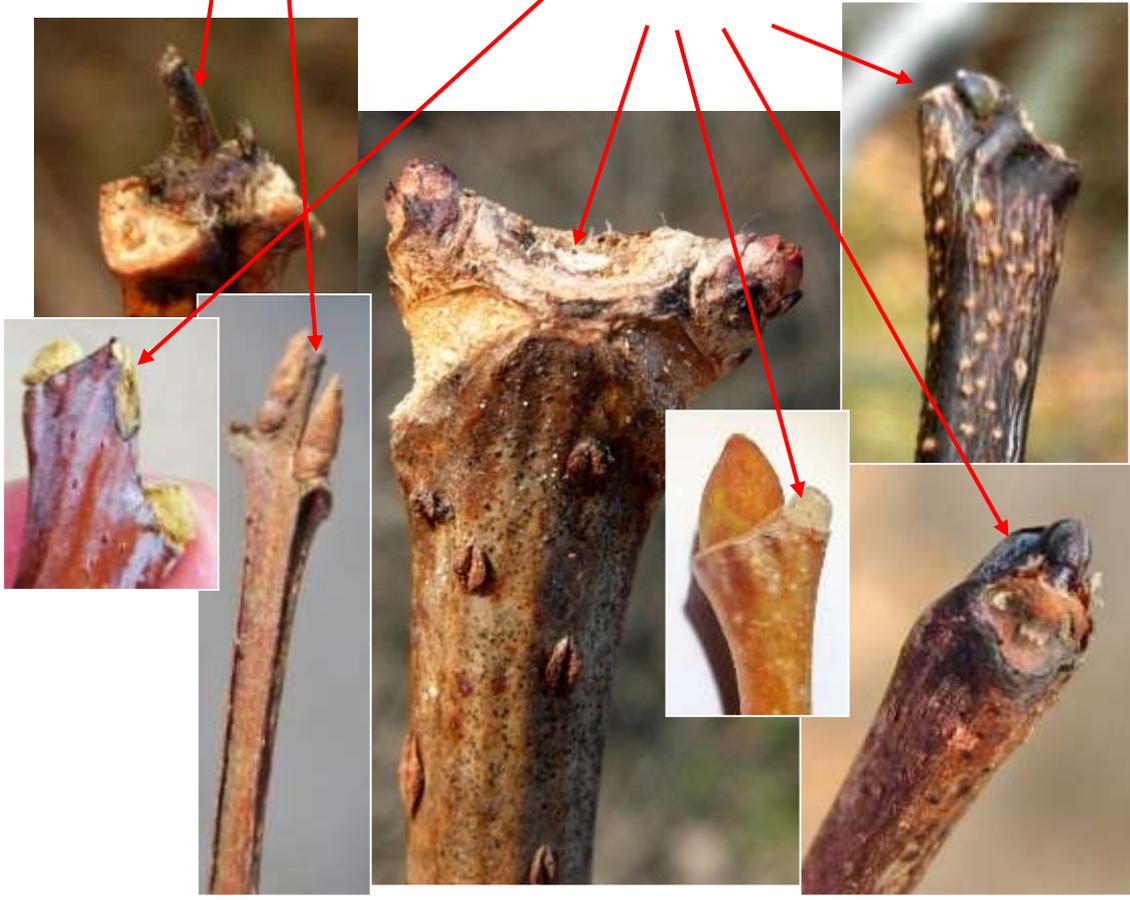
**Naked Terminal (and Lateral) Buds** - no bud scales present, outside of leaf structure wraps around inner leaves to help protect them, hairs and scales are very common

**False (pseudo) Terminal Buds** – no **True Terminal Bud** present, a small branch will typically continue to grow until food is gone, etc. The Lateral Bud will be on a slant and a **Branch Scar (or Fruit Scar)** will be present. Whether a bud is a True or False Terminal Bud is often important in ID



Small piece of leftover branch, will give a **Branch Scar** later when it weathers or is broken off

**Branch Scar (or Fruit Scar)** – scars left from breaking off of a branch (bark, wood, and pith concentric circles present) or fruit stalk



# PLANT TERMS – Twig Pith and Cross-Section

[V. Max Brown]

Twigs may be round, oval, 3,4 or 5 angled and perhaps other?

Another diagnostic tool is the **size, shape, color and structural type** of **Pith** in twigs or branchlets (a few species have hollow twigs). **\*\*pith below roughed up from knife blade**

**Continuous** - fairly **Dense** to **Spongy** Pith

**Chambered** Pith, interrupted by thin plates

**Pith Interrupted** at node with solid wood sections



Box-Elder  
[Ash-Leaved  
Maple]  
*Acer  
negundo* L.

American  
Snowbell  
*Styrax  
americanus*  
Lam.

Black Walnut  
*Juglana nigra* L.

Grape Vine *Vitis* sp.



Round  
(Terete)

**Square** with  
slight wings

**Pith** (in cross-section) may be round, oval, triangular and star-shaped (sort of 5-pointed), dense or spongy, colored, large or small, etc.



# PLANT TERMS – Buds

[V. Max Brown]

The opening and development of leaves and flower of an Ohio Buckeye tree



# PLANT TERMS – Buds

[V. Max Brown]

**Sprouts** or **Shoots** from activated inactive buds (possibly) but may be new **adventitious buds** generated because the main stem was cut (wounded).



**Tough Vine**



# PLANT TERMS – Tree Trunks

[V. Max Brown]

The terms **Soft** and **Hard** Woods is based on reproduction and not on the actual 'hardness' of the wood

## Soft Woods –gymnosperms



## Hard Woods - Angiosperms



**Growth rings in Bark** – age cannot be determined because outer cork layers sloughing off



**Yearly Growth Rings** – wider rings represent higher (faster) growth than thin rings



**Phloem** – food conducting tissue (in inner bark)

**Sapwood or Xylem** – active water conducting tissue

**Heartwood** – darker, often occluded inner wood

**Bark**

A detailed cross-section of wood showing various tissues. Red arrows point to the bark, phloem, sapwood, and heartwood. The phloem is the outermost layer, followed by the sapwood, and the heartwood is the innermost, darker part.

# PLANT TERMS – Leaf Color

[V. Max Brown]

As the cool/cold Fall weather occurs the green chlorophylls of the leaf begin to break down and other color compounds are seen; the yellow of carotene and xanthophyll and the accumulation of sugars under the right conditions gives a deep red. Eventually all leaves turn brown.

**Marcescent** – a floral term that describes a part that withers but does not drop early, it persists as in the leaves of some trees or certain floral parts of flowers still present at the fruiting stage or well into winter or until the next years buds break.

