

## Plant Profiles: HORT 2242 Landscape Plants II

### HOW TO IDENTIFY A PINE, SPRUCE AND FIR

**Genera:** *Pinus* (pine), *Picea* (spruce), *Abies* (fir)

**Family Name:** Pinaceae – pine family

**General Description:** Pines, spruces and firs are members of the Pinaceae family and share basic morphological and reproductive characteristics. Pines, spruces and firs are pyramidal trees (at least when young) with branches growing in a whorled pattern. They are monoecious, cone-bearing plants. To the casual observer they look very much the same and are frequently lumped together and called a “pine” or often “a Christmas tree”. However, if one follows a few basic steps it is easy to identify a pine from a spruce from a fir.

Steps to take to determine pine, spruce or fir:

1. How many needles and how are they attached? This should be the first decision you make as it tells you what genus it could or absolutely could not be.
2. Cone features
  - a. Are the cones pendulous or upright?
  - b. How do the cones mature? Does it take two years for the cones to mature? Do they stay intact at maturity or do they disintegrate upon maturity?
3. Bud features – Are there terminal and lateral buds? Only terminal buds? What do they look like?
4. Whole plant/Habit – Is it pyramidal when young, but broadens with age (loses apical dominance)? Is the tree pyramidal throughout its lifespan? Notice size, shape, form and color as you approach the tree as these features will all help to confirm the identification of the plant.

#### Resources Consulted:

Dirr, Michael A. *Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics, Culture, Propagation and Uses*. Champaign: Stipes, 2009. Print.

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#### Pinaceae characteristics:

- Description: Pines, spruces and firs are gymnosperms. Gymnosperms do not produce true flowers or true fruits although their reproductive structures are often loosely referred to as such. They are monoecious; producing male pollen cones and separate female seed cones all on the same plant. This image shows the male pollen cones. They are usually clustered at the base of the new shoot and turn yellow with pollen. The wind disperses the pollen and the pollen cones then turn brown, dry up and eventually fall off the stem.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: April 28, 2010
- Image File Name: pinaceae\_7593.png



#### Pinaceae characteristics:

- Description: The female seed cones are produced at the tip of the new shoot. The newly developed cone is often colorful and can be quite ornamental upon close inspection. This color phase quickly changes as the female seed cone is fertilized and matures.
- Image Source: USDA-NRCS PLANTS Database / Herman, D.E., et al. 1996. *North Dakota tree handbook*. USDA NRCS ND State Soil Conservation Committee; NDSU Extension and Western Area Power Administration, Bismarck.
- Image Date: Unknown
- Image File Name: pimu80\_002\_lhp.jpg



#### Pinaceae characteristics:

- Description: Notice the male pollen cones at the base of the new shoot of this pine. The new shoot is also called the "candle". The female seed cone will develop at the top of this shoot, a new terminal bud will develop and the needles will expand.
- Image Source: Karren Waisel, TreeTopics.com
- Image Date: April 28, 2010
- Image File Name: pinaceae\_7585.png



#### Leaf Number/Attachment: *Pinus*

- Description: If there are 2, 3 or 5 needles attached in a fascicle (bundle) on the stem, it is *Pinus*. On 2 and 3- needle pines, the fascicle is held in place with a thin membranous sheath called a fascicle sheath or bundle sheath. On 5-needle pines the fascicle sheath is quickly deciduous and will not be present.
- Image Source: Karren Waisel, TreeTopics.com
- Image Date: 2014
- Image File Name: pinus\_leaf\_00.png





**Leaf Number/Attachment: *Picea***

- Description: If there is only one needle attached at a site on the stem, look closely to see how it is attached. If the needle attaches to a small, peg-like structure it is *Picea*. The peg-like structure remains on the stem after the needle falls off creating a rough stem.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: January 3, 2014
- Image File Name: picea\_leaf\_4209-4205.png



**Leaf Number/Attachment: *Abies***

- Description: If there is only one needle and the needle attaches directly onto the stem leaving a circular leaf scar, it is *Abies*.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: September 7, 2008
- Image File Name: abies\_leaf\_3744.png



**Leaf Number/Attachment: *Abies***

- Description: Observe the slightly concave, circular leaf scar of *Abies*.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: January 31, 2011
- Image File Name: abies\_leaf\_1250001.png



Karren Wcisel © 2009

**Cone: *Pinus***

- Description: *Pinus* cones take two years to complete their life cycle. On a pine it is common to see young, immature 1<sup>st</sup> year cones and mature (open or unopened) 2<sup>nd</sup> year cones all on the same plant. Notice the immature cones developing near the top of this stem and the mature cone on older growth.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: March 6, 2009
- Image File Name: pinus\_cone\_1110598.png



Karren Wcisel © 2014

**Cone: *Picea***

- Description: *Picea* cones are pendulous. Their cones mature and usually shed in the same season. The entire cone falls off.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: August and February
- Image File Name: picea\_cone\_00.png



**Cone: *Abies***

- Description: *Abies* cones are erect on the branch.
- Image Source: USDA-NRCS PLANTS Database / Herman, D.E., et al. 1996. *North Dakota tree handbook*. USDA NRCS ND State Soil Conservation Committee; NDSU Extension and Western Area Power Administration, Bismarck.
- Image Date: Unknown
- Image File Name: abco\_003\_pvp.png





**Cone:** *Abies*

- Description: The cone scales disintegrate as they mature leaving the upright central axis on the stem.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: October 31, 2008
- Image File Name: abies\_cone\_1070570.png



**Cone:** *Abies*

- Description: *Abies* cone scales after they have abscised from the cone.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: November 2, 2008
- Image File Name: abies\_cone\_1070881.png



**Bud:** *Pinus*

- Description: Plants in the genus *Pinus* only produce terminal buds and do not have buds scattered along the stems. There may be just one bud in the terminal position or one terminal bud with 3 or 4 buds just below it forming a whorl. The buds of the different species of pine can vary in size, shape and other characteristics.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: February 4, 2011
- Image File Name: pinus\_bud\_1250133.png



**Bud: *Pinus***

- Description: The arrow is pointing to a terminal bud on a pine. In this example the structures below the terminal bud are male pollen cone buds that will open in spring, mature and disperse pollen. These are different than the vegetative terminal buds in the prior example in location, number, look and function.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: December 28, 2010
- Image File Name: pinus\_bud\_1240417.png



**Bud: *Picea***

- Description: Plants in the genus *Picea* have terminal buds and lateral buds. The terminal buds are ovoid with imbricate scales that are often reflexed. The buds may or may not be resinous.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: February 10, 2011
- Image File Name: picea\_bud\_1250474.png



**Bud: *Picea***

- Description: Notice the lateral buds of *Picea* scattered along the stems of the newest growth.
- Karren Wcisel – January 5, 2012
- Image File Name: picea\_bud\_1340518.png





**Bud: *Abies***

- Description: Plants in the genus *Abies* also have terminal and lateral buds. The terminal buds are ovoid in shape and often resinous.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: November 11, 2010
- Image File Name: abies\_bud\_1220836.png



**Bud: *Abies***

- Description: Notice the lateral buds of *Abies* scattered along the stems of the newest growth.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: November 11, 2010
- Image File Name: abies\_bud\_1220838.png



**Whole plant/Habit: *Pinus***

- Description: Plants in the genus *Pinus* are pyramidal when young.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: September 27, 2010
- Image File Name: pinus\_habit\_2104.png



**Whole plant/Habit:** *Pinus*

- Description: As pines mature they lose apical dominance and become more rounded, broad and picturesque.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: November 21, 2008
- Image File Name: pinus\_habit\_1080501.png



**Whole plant/Habit:** *Picea* and *Abies*

- Description: *Picea* and *Abies* are pyramidal when young and maintain that shape throughout their lifespan. A pine at this stage of maturity would already have lost apical dominance.
- Image Source: Karren Wcisel, TreeTopics.com
- Image Date: 2009
- Image File Name: picea\_abies\_habit.png